



This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

### Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

- + *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.
- + *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.
- + *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.
- + *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

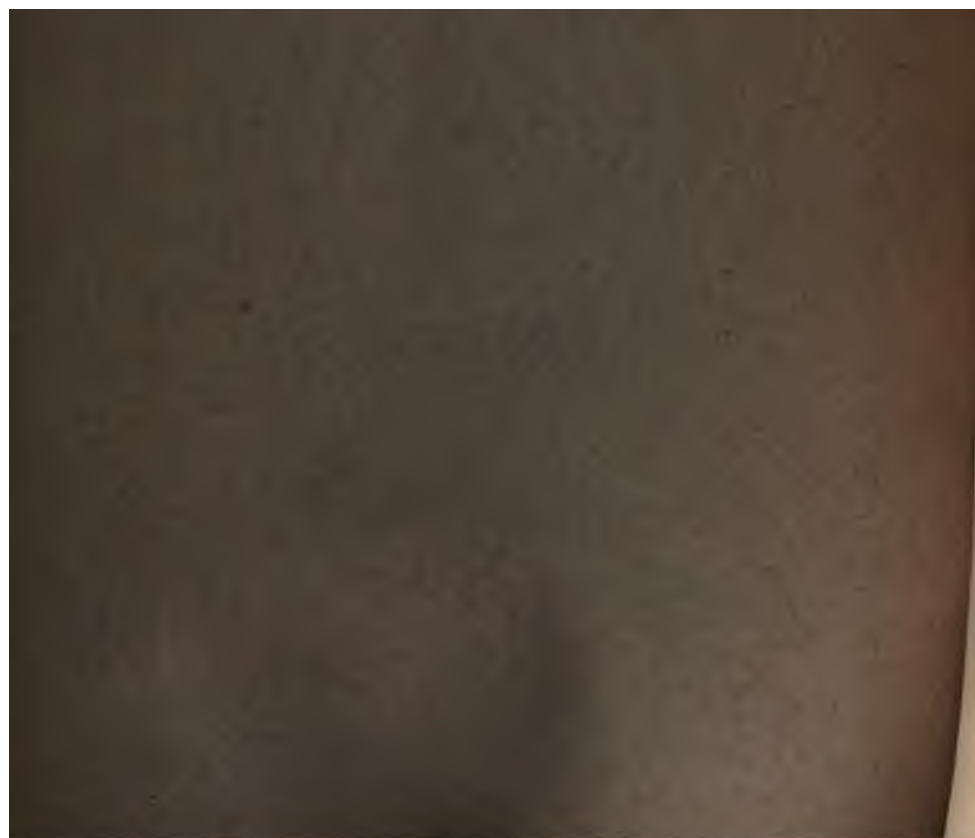
### About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at <http://books.google.com/>



3 3433 06275399 5











330574

REPORT

OF THE



OPERATIONS OF THE ENGINEER DEPARTMENT

OF THE

DISTRICT OF COLUMBIA

FOR

THE YEAR ENDING JUNE 30, 1900,

UNDER THE DIRECTION OF

CAPTAIN LANSING H. BEACH, CORPS OF ENGINEERS, U. S. A.,

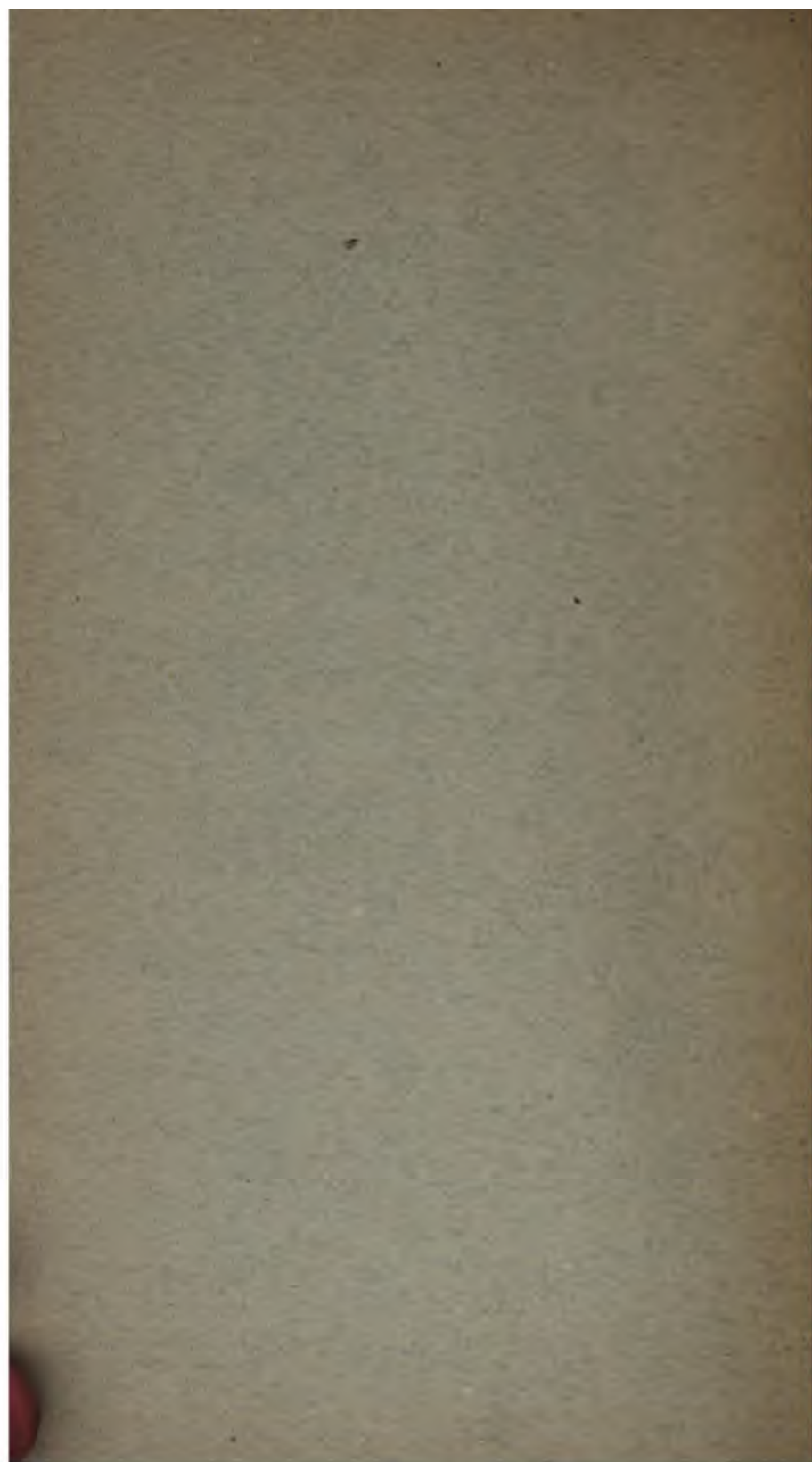
ENGINEER COMMISSIONER, DISTRICT OF COLUMBIA.

---

WASHINGTON:

GOVERNMENT PRINTING OFFICE.

1900.



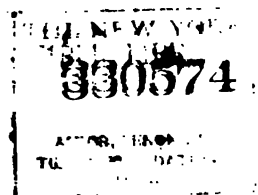
[REPORT OF THE COMMISSIONERS OF THE DISTRICT OF COLUMBIA, VOL. II.]

---

REPORT  
OF THE  
OPERATIONS OF THE ENGINEER DEPARTMENT  
OF THE  
DISTRICT OF COLUMBIA  
FOR  
THE YEAR ENDING JUNE 30, 1900,  
UNDER THE DIRECTION OF  
CAPTAIN LANSING H. BEACH, CORPS OF ENGINEERS, U. S. A.,  
ENGINEER COMMISSIONER, DISTRICT OF COLUMBIA.

---

WASHINGTON:  
GOVERNMENT PRINTING OFFICE.  
1900.



EXTRACT FROM THE REPORT OF THE COMMISSIONERS OF THE  
DISTRICT OF COLUMBIA FOR THE YEAR ENDED JUNE 30, 1900.

OFFICE OF THE COMMISSIONERS  
OF THE DISTRICT OF COLUMBIA,  
*Washington, December 1, 1900.*

The PRESIDENT:

The Commissioners of the District of Columbia herewith submit, for the information of Congress, as required by law, their annual report of the official doings of the government of said District for the fiscal year which ended June 30, 1900.

\* \* \* \* \*

OPERATIONS OF THE ENGINEER DEPARTMENT.

The engineer department of the District of Columbia was, during the fiscal year, under the charge of Capt. Lansing H. Beach, Corps of Engineers, U. S. A. He had as assistants Capt. William P. Craighill, Corps of Engineers, from July 1 to about September 15; Capt. D. D. Gaillard, Corps of Engineers, from September 11, and Capt. H. C. Newcomer, Corps of Engineers, from January 15 to the close of the fiscal year.

Captain Gaillard was placed in charge of the water, sewer, plumbing, and building divisions, and Captain Newcomer was given supervision over streets, county roads, bridges, surveyor's office, and parking commission.

STREET AND ALLEY PAVEMENTS.

Details of the work relating to street and alley pavements and county roads will be found in the report of the computing engineer, Mr. C. B. Hunt, for which see page 77.

Sheet asphalt and asphalt block were the only materials used for street pavements during the year. Vitrified block was used mainly in alleys, a few of which, however, were paved with asphalt block.

The prices paid for sheet asphalt were \$1.78 and \$1.80 per square yard; asphalt block, \$1.77 per square yard. For the coming year the prices will be \$1.79½ for sheet asphalt and \$1.77 for asphalt block.

It is again recommended that the granite-block pavements throughout the city be replaced as rapidly as possible with sheet asphalt or asphalt block. Business men generally on streets paved with this class of material have petitioned repeatedly for a smooth and less noisy pavement. The granite block is undoubtedly a detriment to a business street under the conditions prevailing in Washington, as such pavements are more or less avoided by traffic and trade diverted thereby. The Commissioners earnestly urge that the improvements desired be carried out as rapidly as possible.

While granite block is a most economical pavement as far as maintenance is concerned, its noise and roughness, compared with the smooth pavements and light traffic which prevail generally in this city, make it highly undesirable in Washington. This condition of affairs has been recognized by the various Government departments and by Congress in several instances. The granite block pavement has been removed from Seventh street, between E and G streets, in front of the Post-office and Interior Department buildings, the Secretaries of these departments having urged the matter. The Director of the Census now desires to have the granite block adjacent to the Census building removed also. This can not be done, however, unless Congress makes an appropriation for the purpose.

Excellent use can be made of the blocks removed in paving the main thoroughfares leading into the city from the county. An example of work of this character may be seen on the Bennings road, where a pavement consisting of a central strip of asphalt ten feet wide, flanked on either side with strips of granite block filling the remainder of the roadway width, has been completed during the year, which has resulted in a vast improvement in the condition of the road. If all of the main thoroughfares leading into the city could be treated in like manner, the cost of repairs would be greatly reduced and much more work accomplished with the repair appropriation, of which there is urgent need, as owing to the small funds provided for their care and maintenance, the county roads of the District are not in the condition that they should be, and on the main highways connecting the city with the country, macadam has not the qualities to enable it to sustain the heavy travel.

#### BRIDGES.

Attention is again invited to the need of a better bridge in place of the present Navy-Yard Bridge over the Anacostia River. In addition to being entirely too narrow for the traffic passing over it, the bridge is structurally weak, and it is believed that the only satisfactory action would be to replace it with a modern structure of ample width. The Commissioners have frequently included this item in their estimates to Congress.

After considerable trouble and delay the necessary right of way has been secured for the Massachusetts Avenue Bridge over Rock Creek. A contract has been let for the work, which is now being rapidly pushed.

The current District appropriation act contains an item of \$40,000 for the foundations for the Connecticut Avenue Bridge over Rock Creek, work upon which will commence shortly.

#### DISTRICT QUARRY.

During the year the District quarry at Dickerson, Md., has been operated in a satisfactory manner. A contract has been awarded to the Standard Lime and Stone Company, of Baltimore, Md., for operating the quarry for a period of five years. Three powerful new crushing machines are now being installed, and the contractor will soon be able to turn out large quantities of material.

The stone obtained from the quarry is a traprock of excellent quality. It is to be used in the construction of macadam roadways,

for which purpose it is most admirable, as it binds well and on account of its hardness it grinds very slowly under traffic, and therefore causes but little dust. Copy of a test made by the department of road inquiry is here inserted, which shows that the stone from this particular quarry is one of the best macadamizing materials to be found in this country.

TEST No. 1.—*Abrasion test for wearing quality.*

LOSS BY RUBBING AND KNOCKING SPECIMENS TOGETHER IN AND OUT OF WATER.

[Tests made by M. O. Eldridge, November, 1897, for the information of the Engineer Commissioner of the District of Columbia.]

Locality or name of stone.	Weight before testing.	After testing.	Loss.
	<i>Grams.</i>	<i>Grams.</i>	<i>Grams.</i>
Goose Creek (Virginia) trap.....	110.600	109.700	0.900
Hudson River trap.....	101.200	100.500	.700
Goose Creek (Virginia) trap.....	110.850	109.900	.950
Potomac River bluestone, Gilbert's.....	120.550	118.550	2.000
Dickerson (Md.) trap.....	55.250	54.450	.700
Rockyhill (N. J.) trap.....	55.550	54.825	.725
Goose Creek (Virginia) trap.....	108.100	107.300	.800
Boundbrook (N. J.) trap.....	109.050	108.200	.850
Goose Creek (Virginia) trap.....	84.735	82.975	1.400
Buck Lodge (Md.) trap.....	103.850	102.550	1.300
Do.....	175.150	173.150	2.000
Hudson River (New York) trap.....	141.950	139.875	2.075

N. B.—Small samples had to be used in this hand test. Larger samples can be used where the necessary apparatus is available; consequently the results are usually more accurate and satisfactory.

TEST No. 2.—*Specific gravity test.*

Location or name of stone.	Specific gravity.
Rockland Lake or Hudson River (New York) trap.....	2.90
Boundbrook (N. J.) trap.....	2.97
Potomac River graystone.....	2.80
Potomac River bluestone.....	2.81
Dickerson (Md.) trap (Baltimore and Ohio).....	2.915
Goose Creek, Virginia, near Belmont, on Southern R. R.....	3.02
Buck Lodge (Md.) trap.....	3.10

TEST No. 3.—*Absorption test.*

PERCENTAGE OF MOISTURE ABSORBED AFTER FORTY-TWO HOURS IMMERSION IN WATER.

Name.	Weight, dry.	Weight, wet.	Gain.	Per cent of gain.
Potomac River bluestone.....	122.750	122.950	0.200	0.163
Halpine (Md.) diorite.....	102.100	102.300	.200	.196
Goose Creek (Virginia) trap.....	112.750	112.850	.100	.089
Lambardsville (N. J.) trap.....	99.200	99.300	.100	.100
Potomac River graystone.....	89.675	89.750	.075	.084
Palisades (Hudson River) trap.....	139.475	139.500	.025	.019
Boundbrook (N. J.) trap.....	108.200	108.200	.....	.....
Dickerson (Md.) trap <sup>1</sup> .....	166.050	166.050	.....	.....

<sup>1</sup>These tests demonstrated that the Dickerson (Md.) stone possesses, first, remarkable resistance to physical force, hence great wearing quality; second, great density or specific gravity; third, little or no absorption, consequently great resistance to frost, and for these reasons was selected by the District Commissioners for road metal for the city of Washington and vicinity. A large crushing plant has been erected at Dickerson, Md., and first-class trap rock is now being prepared and used for road building in the District.

Owing to the situation of the quarry upon the Baltimore and Ohio Railroad and the manner in which the road runs through the District, a minimum wagon haul is involved in delivering the stone at the necessary points on the county roads, so that greater economy results from the use of this stone than from the ordinary local stone; the gain is, therefore, not only in quality, but also in a greatly reduced price.

The difference in the wear was very distinctly shown during the past year upon the road along the line of Rock Creek. A portion of the road was covered with broken limestone and a portion with trap rock from the District quarry. Owing to the failure of the appropriation it was impossible to cover the broken stone (which was 2 inches in size) for a distance of about half a mile. As there were no points at which vehicles could turn off from the road, both classes of stone received exactly the same amount of wear. The limestone was worn quite smooth and rounded. The trap rock failed to show even the wheel marks, and the edges were as sharp after several months' wear as when the stone was first laid.

In making roads with this material stone from one-half inch to 2 inches in size is first placed on the road, generally to a depth of about 8 inches; upon this layer a finer material, half an inch and smaller in diameter, including dust, is deposited. It has been found that the grinding action of vehicles passing over the road is practically so little that no account can be taken of this wear with the trap rock, and a larger quantity of finer material has to be used than is necessary with other local stones, which wear down and make a binding material. Although a larger portion of the finer stone is required, the result is most excellent, and the stone binds exceedingly well without the addition of any binder.

#### SIDEWALKS.

During the year 56,505 square yards of cement sidewalks were laid. The price for this work was 96 cents per square yard. The cement walk costs but little more than brick, and its life and advantages are so much greater that but a comparatively small amount of brick walk is now laid, only 8,300 square yards being constructed during the year.

The highly desirable work of replacing the defective brick walks of the city with cement is being pushed as fast as the appropriations for the purpose will permit. The superiority of the cement walk is fully recognized by the people, as it is exceptional now to receive a request for a brick walk from any portion of the District. The advantages of cement over brick in this climate are very great, as during the long summer with brick walks there is certain to be more or less vegetation springing up between the bricks. This of course does not occur with the cement walk, and in the outlying sections it is actually cheaper to construct a cement walk at the contract price than to haul brick from the lower portion of the city to these localities and then lay it.

It has been found necessary to lay expansion joints in the cement walks, as experience showed a number of the walks injured by expansion due to heat.

#### RAILWAYS.

At last there seem to be good grounds for hope that steps will be soon inaugurated to improve the steam railroad situation in Washing-

EXTRACT FROM THE REPORT OF THE COMMISSIONERS OF THE  
DISTRICT OF COLUMBIA FOR THE YEAR ENDED JUNE 30, 1900.

OFFICE OF THE COMMISSIONERS  
OF THE DISTRICT OF COLUMBIA,  
*Washington, December 1, 1900.*

The PRESIDENT:

The Commissioners of the District of Columbia herewith submit, for the information of Congress, as required by law, their annual report of the official doings of the government of said District for the fiscal year which ended June 30, 1900.

\* \* \* \* \*

OPERATIONS OF THE ENGINEER DEPARTMENT.

The engineer department of the District of Columbia was, during the fiscal year, under the charge of Capt. Lansing H. Beach, Corps of Engineers, U. S. A. He had as assistants Capt. William P. Craighill, Corps of Engineers, from July 1 to about September 15; Capt. D. D. Gaillard, Corps of Engineers, from September 11, and Capt. H. C. Newcomer, Corps of Engineers, from January 15 to the close of the fiscal year.

Captain Gaillard was placed in charge of the water, sewer, plumbing, and building divisions, and Captain Newcomer was given supervision over streets, county roads, bridges, surveyor's office, and parking commission.

STREET AND ALLEY PAVEMENTS.

Details of the work relating to street and alley pavements and county roads will be found in the report of the computing engineer, Mr. C. B. Hunt, for which see page 77.

Sheet asphalt and asphalt block were the only materials used for street pavements during the year. Vitrified block was used mainly in alleys, a few of which, however, were paved with asphalt block.

The prices paid for sheet asphalt were \$1.78 and \$1.80 per square yard; asphalt block, \$1.77 per square yard. For the coming year the prices will be \$1.79½ for sheet asphalt and \$1.77 for asphalt block.

It is again recommended that the granite-block pavements throughout the city be replaced as rapidly as possible with sheet asphalt or asphalt block. Business men generally on streets paved with this class of material have petitioned repeatedly for a smooth and less noisy pavement. The granite block is undoubtedly a detriment to a business street under the conditions prevailing in Washington, as such pavements are more or less avoided by traffic and trade diverted thereby. The Commissioners earnestly urge that the improvements desired be carried out as rapidly as possible.

ers during the year of the delay in getting plans acted upon and permits issued by the office of the inspector of buildings. This trouble is not due to any dereliction on the part of the employees of the building division. On the contrary, these employees are probably the hardest worked of any in the District service. They come to the office before the opening hour and work daily until long past the regular closing time, and they get only a small portion of the thirty days' leave allowed by law. Several of them during the year have broken down from overwork, which has made the burden that much heavier for those remaining on duty. The force of the office is utterly inadequate to handle the volume of business devolving upon it. The building operations have grown to such an extent and have spread over so much territory that it is physically impossible for the present force to keep buildings and elevators under proper inspection, and the Commissioners feel it to be their duty to let this fact be known in order that the office may not be held responsible for conditions which, under present circumstances, it is powerless to prevent. An adequate increase of the force of this office is submitted in the annual estimates and it is earnestly recommended that it be granted.

#### SCHOOL BUILDINGS.

It was found impossible during the last fiscal year to construct the school buildings, with a single exception, for which appropriations were made. This failure to erect the buildings was due to the great rise in the price of building materials, which caused the cost of the buildings to exceed the appropriations made. However, Congress at its last session made the necessary increase in the amounts, and all of the buildings are now in process of construction and it is hoped to have them available for occupancy by the beginning of the next school year.

The system of having the plans prepared by various architects has been followed with advantage, and it is believed that it ought to be kept up, as it has been found that plans prepared by the same architect are marked by more or less similarity, and by engaging different persons for the different buildings a pleasing diversity is secured.

Congress at its last session, at the request of the Commissioners, made a proviso that hereafter in purchasing school sites sufficient ground should be obtained to permit an eight-room building to be enlarged to a twelve-room one, and in the purchase of school lots during the year this object was kept in view.

Competitive designs will be shortly received from all architects who desire to enter the competition for a typical eight-room building which can be erected in such manner as will admit of economical, ready, and practical enlargement to a twelve-room building. It is also proposed to construct the four-room buildings for which appropriations have been made so that they can be readily enlarged should the needs of the locality require.

Formerly it was the custom to construct a four or eight room building complete in itself and of such design that additions could not be made without practically destroying the use of some of the rooms. In some sections of the city this has made necessary the existence of a number of school buildings in very close proximity, and while the school authorities are believed to be right in not favoring large school buildings in order to avoid the collection of too many children in one

place, it is believed that the eight-room building is inadequate for some of the densely populated localities, and that a twelve-room building will meet the demands much better. It has been preferred in this city to make the school buildings but two stories high, as parents and school authorities are not in favor of requiring the children to climb more than one flight of stairs.

It is believed that due attention should be given to the securing of proper playgrounds for the children, both at school and also in the various neighborhoods during hours when they are not at school. The streets of Washington are wide and provided with good pavements and form attractive playgrounds for the children, greatly to the inconvenience of vehicle traffic and to the danger of the little ones. Grounds in some of the outlying sections can be purchased now at a reasonable cost and can be set aside for public playgrounds hereafter. There also exist in the city a large number of vacant lots which could be now secured at reasonable figures for the purpose. It is believed that the money outlay involved in this direction would be more than saved to the public by the reduction in costs in other lines of charity, doctors' bills, etc., and the sooner the action is taken the sooner the improvement in the general health, as well as the removal from danger, of the children of the community will be effected.

#### PARKING COMMISSION.

On September 11, 1900, the parking commission lost by death one of its oldest and most valued members, Mr. William Saunders. Mr. Saunders had served upon the commission continuously since its organization in 1871, without any compensation whatever, and the city is largely indebted to him for the present system of shade trees which add so much to the beauty and attractiveness of Washington. The vacancy caused by his death has been filled by the appointment of Mr. Trueman Lanham, for many years superintendent of parking. Mr. Lanham has had long experience in this line of work and is well fitted for the duties of the position.

The question of the use and arrangement of parkings along public streets is one which is becoming a matter of great importance, which importance is likely to increase rather than diminish. The streets of Washington consist of three parts—the driveway, ordinarily in the center of the street; the sidewalks, generally on each side of the driveway, and the parking, between the sidewalk and houses. The parking thus forms the front yards of the houses on nearly all residence streets in the District, and the property owners thus get from the municipality what in all other cities they have to pay large prices for. Projections have been allowed in the past of steps, bay windows, and porches, but the people are beginning to construct houses so as to practically narrow the parking by the extent of the building projections allowed. This being 5 feet for bay windows, the practical effect is to reduce a 90-foot street to an actual width of 80 feet, and a secondary effect is to ruin the architecture of the capital city. It seems to be a part of human nature to take all that can be obtained for nothing; and, as no charge is made for these encroachments upon the public streets, very few seem to be willing to build a house without securing a bay window, thus producing a uniformity in the appearance of residences which is rapidly becoming such an invariable feature as to mar,

as before said, the architectural appearance of the city. It is recommended that the schedule of projections in front of buildings be modified so that the present narrowing of the streets, which is going on all over the District, will be restricted to a reasonable degree. The extent to which this is carried in individual cases may be realized when it is stated that in a recent application for permit to build upon a corner lot the proposed house was so designed that 27 per cent of it was to stand on the public street, and numbers of very similar cases could be cited if necessary.

The appearance of the national capital would also be greatly improved if the property owners would take a little more care of the grass in front of their premises. Where street pavements are furnished without any charge whatever against the abutting property, and the property has to pay only half the cost of sidewalks and curbs, and the trees are set out and cared for by the municipality, it would seem as if it were but a small service to ask of the property owner to keep the parking in an attractive condition.

An attempt was made by one of the Engineer Commissioners a few years ago to construct walks leaving a space for a grass plat between the walk and the curb, an arrangement that is adopted in many of our cities with success and with great advantage to the appearance of the streets, but as the property owner in Washington would not keep this space in condition, the result was unsightly bare spots or mud holes bordering the streets where the attempt was made, so that recent sidewalks have been laid to the curb, leaving a space only 4 by 7 feet around each tree. This is not sufficient to secure proper nourishment for the trees; it of course has the mineral constituents of the soil, but it does not allow the ready application of fertilizers to assist it in growth. The result is that trees soon reach their maturity and decay and die long before what should be their allotted period of life. This makes great expense in replacing trees and deprives the property of the advantage of well shaped trees just at that period of tree life when it should be worth the most. If property owners would take care to keep the grass between the curb and sidewalk in good condition, it is known that the effect on the enhanced beauty of the city would be very great and also a similar effect could be produced on the life and character of the trees. That grass can be well grown under these conditions is amply proved by the fact that these continuous tree spaces or grass plats have been left where the property owners have informed the office that care would be taken of the grass, and there is no case on record where such promise has been given of the grass not being of such quality and character as to add to the beauty of the city.

Statements are made that grass can not be retained under these circumstances; but observation shows that in many cases the manner of sprinkling the grass is responsible for this bad condition, for by turning the hose on with too much power the water practically washes the grass out of the soil, or washes the fine soil away, leaving nothing but hardened material. If citizens would take some pains to keep the grass in good condition it is believed that the effect upon the beauty of Washington would be surprising, even to its oldest inhabitants.

#### HIGHWAY-EXTENSION PLANS.

The work of this department is shown in detail by the report of Mr. W. P. Richards, assistant engineer in charge.

During the year the last section of the highway plans was completed and placed on record. These plans now cover the entire District of Columbia and are of inestimable value as a guide in laying out streets and subdividing land. Now, an owner in any part of the District, however remote from the city, can, if he so desires, lay out his streets and subdivide his property with the knowledge that ultimately when the city reaches him his subdivision will be in accord with the city plan and connect smoothly with streets extended from the city. This has been a work of considerable magnitude, and the Commissioners are largely indebted to Mr. W. P. Richards, who has been assistant engineer in charge since the inception of the work, for the manner in which the many difficult problems in connection therewith have been met and overcome.

In conclusion, it is deemed only fitting to acknowledge the good work of the assistants and of the clerical force of the various departments of the office, who have not spared themselves in carrying out their duties to the best of their ability.

Very respectfully,

HENRY B. F. MACFARLAND,  
JOHN W. ROSS,  
LANSING H. BEACH,  
*Commissioners of the District of Columbia.*



# REPORT OF THE OPERATIONS OF THE ENGINEER DEPARTMENT.

## FIRST DIVISION.

Capt. D. D. GAILLARD,

*Corps of Engineers, United States Army, Assistant to the Engineer Commissioner, in charge.*

WATER DISTRIBUTION.....	W. A. MCFARLAND, <i>Superintendent, Water Department.</i>
WATER RATES.....	GEORGE F. GREEN, <i>Water Registrar and Chief Clerk, Water Department.</i>
SEWER CONSTRUCTION AND MAINTENANCE.....	D. E. McCOMB, <i>Superintendent of Sewers.</i>
PLUMBING PLANS AND INSPECTION.....	CHARLES B. BALL, <i>Inspector of Plumbing.</i>
BUILDINGS AND BUILDING INSPECTION.....	J. B. BRADY, <i>Inspector of Buildings.</i>
	A. M. LAWSON, <i>Inspector of Elevators.</i>
REPAIRS TO BUILDINGS.....	L. E. BOND, <i>Superintendent of Repairs.</i>

## REPORT OF ASSISTANT IN CHARGE.

OFFICE OF THE ENGINEER COMMISSIONER,  
DISTRICT OF COLUMBIA,  
Washington, August 1, 1900.

CAPTAIN: I have the honor to submit the following report of the operations of the divisions of the engineer department under my charge for the year ending June 30, 1900.

## WATER DIVISION.

During the year 73,059 feet (14 miles) of new mains, of different sizes, were laid. The south basin of the new Brightwood Reservoir was completed and filled on January 7, 1900. This basin has been continually in use ever since, except for a short period during the month of May. It is built of concrete and has a capacity of 15,000,000 gallons; the reference of its water surface, when full, is 276 above District of Columbia datum. Work is now in progress upon the north basin, which is to be similar in every respect to that just described. The reservoir is connected to the city by a 36-inch cast-iron main, on which are placed four divide valves 20 inches in diameter. Preliminary experiments made by the superintendent of the water department indicated that the loss of head due to contraction, by means of conical reducers, from the 36-inch main to the 20-inch valve would be comparatively small and would be more than compensated for by the ease of manipulation and rapidity with which these valves could be closed in case of emergency. In addition, their cost was much less than that of the 36-inch valves. Under present conditions, during the maximum flow from the reservoir to the city, the total loss of head due to contraction by these four 20-inch valves is 1.24 feet. When certain contemplated changes in the distribution system have been made the maximum rate of flow from the reservoir will not exceed 6,000,000 gallons in twenty-four hours and the total loss of head due to the four 20-inch valves will then be only about 0.4 foot. As but little data is available relating to loss of head in like cases, attention is invited to the report of the superintendent of the water department, page 21, and to the interesting curve showing the measured loss of head at different velocities due to contraction caused by inserting a 6-inch valve on a line of 12-inch pipe.

An increase of from 6 to 8 feet of head during the day in the water service on Capitol Hill has resulted from the completion of the south basin of the Brightwood Reservoir. Most of the pumping can now be done at night, and the very heavy draft on the low-service mains necessary to supply the pumping station is no longer made during the daytime.

Two of the boilers at the U street pumping station have been equipped with Roney mechanical stokers and two with Hawley down-draft furnaces.

During the year 2,502.9 million gallons of water were pumped, the average per day being 6,857,600 gallons. The mean head pumped against in the middle service was 162 feet and in the high service 355 feet. The total cost of operating the pumping station during the year was \$18,748.37. The cost of pumping 1,000 gallons of water under actual conditions, exclusive of interest on investment, but including 3 per cent depreciation of plant, was 0.875 cents. The average amount of coal used per indicated horsepower per hour was 2.13 pounds.

As the consumption of water in the city is steadily increasing, the areas where pressures are defective are increasing, the trouble being greatest on that portion of Capitol Hill in proximity to the main supplying the navy-yard. Operations are now in progress whereby the supply for the navy-yard will be entirely separated from the domestic supply. Improved pressures should result in the areas just described as well as in the navy-yard.

For some time past it has been felt that a comprehensive project should be prepared for the future extension of the large distribution mains in the District of Columbia, and in accordance with instructions of the Engineer Commissioner the superintendent of the water department, early in 1899, prepared a project for such an extension, for the details of which see page 23 of his report.

Some time after this report was submitted it was learned that the officer in charge of the Washington Aqueduct had prepared a project for filtering the entire water supply of the city, the filtering plant to be located in the vicinity of the new Howard Reservoir. This required a modification of the original project submitted by the superintendent of the water department and necessitated drawing the entire supply for distribution from the vicinity of the eastern extremity of the new aqueduct tunnel. In consequence, a supplemental report was submitted by the superintendent of the water department on November 4, 1899. (For details see page 29 of his report.)

The principal modification embraced in this report was the change in location of the pumping station to a site adjacent to the new reservoir. After conference with the officer in charge of the Washington Aqueduct this project was adopted and will be made the basis of the general plan for future extensions of the distribution system of the District of Columbia.

Permission was obtained from the Secretary of War to use a plot of land containing about  $4\frac{1}{2}$  acres, situated on Trumbull street, as a site for a new pumping station. General plans for this station have been prepared and prominent architects have been invited to submit competitive designs therefor before August 1, 1900.

A contract has been entered into with the Edward P. Allis Company, of Milwaukee, Wis., for two 20,000,000-gallon high-duty pumping engines, for the sum of \$148,000. The contract for these engines must be completed by December 31, 1902.

The operations of the revenue and inspection division of the water department are given in detail in the report of the water registrar, on page 37.

The balance to the credit of the water fund at the beginning of the fiscal year was \$326,575.66, and the total receipts from all sources during the year amounted to \$349,339.01. The total expenditures, less repayments, were \$390,979.56, leaving a balance to the credit of the water fund on July 1, 1900, of \$284,935.11.

Forty-five thousand two hundred and four premises in the District of Columbia are supplied with Potomac water.

One hundred and eight thousand three hundred and sixty-four inspections were made by the inspectors of the water department, and leaks were found in 11,452 premises. The actual number of leaking fixtures is much in excess of this number, as several leaking fixtures are frequently found in the same premises.

\*A curve is submitted herewith showing the daily consumption of water in the District of Columbia, the increase of population, the amount of water pumped, and the number of meters used. An inspection of this curve will show a fairly uniform increase in population, a rapid increase in the daily consumption whenever additional distribution mains have been provided, and a very marked increase, in the last few years, in the percentage of water pumped, amounting at the present time to about 14 per cent of the total amount used in the District of Columbia.

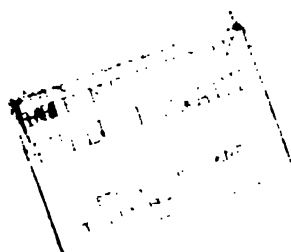
The daily consumption for June, 1900, kindly furnished by the officer in charge of the Washington Aqueduct, is the largest yet measured, being 50,897,227 gallons.

\*Illustration omitted.



98

THE NEW YORK  
PUBLIC LIBRARY  
ASTOR LENOX TILDEN FOUNDATION  
1900



The population of the District of Columbia, as given by the census just completed, is 278,718. The daily consumption, therefore, corresponds to a per capita of 183 gallons, a very large consumption for a city like Washington, where comparatively few manufacturing enterprises exist. Every effort has been made during the year, by means of careful house inspections, to decrease this large use of water, but as the inspectors can not make more than two complete visits over the District during the year, it is evident that in spite of every effort on their part willful waste of water can be but little checked by this method, although it undoubtedly serves as an intermittent check upon defective fixtures.

The only practicable method of reducing the consumption of water is by the introduction of meters. This method has been shown by actual experience in other cities to accomplish the desired result, but when it has heretofore been brought to the attention of Congress and of the public of this city it has not met with approval. It is not improbable that further attention may yet be given to this subject, as, under the act approved June 6, 1900, an appropriation was made for establishing certain portions of a filtration plant, thereby apparently giving the sanction of Congress to the future filtration of the water supply of the District of Columbia.

It has been estimated that the operating expenses of a filtration plant will amount to about \$6 per million gallons of water filtered. Presumably, as heretofore, the District of Columbia will have to pay one-half of this sum, which, at the present rate of consumption, will entail an additional expense of about \$150 per day. With the contemplated increase in the pumping service and the expense necessitated by filtration it is quite improbable that the revenues of the water department will be sufficient to meet the additional charges unless the rates are increased, a proposition which, it is believed, will not be popular. The other alternative is to reduce the consumption, and this, it is believed, can be accomplished only by the use of meters.

The present law requires that meters shall be installed in all apartment houses in the District of Columbia, and interesting data have been obtained from the readings of these meters. Forty-four apartment houses, located in various parts of the city, and containing 1,435 occupants, showed an average daily per capita consumption of 81.3 gallons, the maximum for any one apartment house being 309.1 gallons and the minimum being 16.7 gallons. Half of these apartment houses had an average daily per capita consumption of more than 58 gallons and half of less than 58 gallons. Only 8 of the 44 showed an average daily per capita consumption exceeding 100 gallons.

In contrast to the metered service just described it is interesting to compare observations made in two different sections of the city in 1898, where in each case the amount of water used by a certain definite number of adjoining houses was metered at the service main supplying them without the knowledge of the occupants of the premises. Forty-nine brick houses in Chester court, containing 227 colored tenants, gave an average daily per capita consumption of 166 gallons, and 47 houses in the northwest section, containing 216 occupants, gave an average daily per capita consumption of 213 gallons.

On September 25, 1897, the consumption of water in a residence section of Georgetown, D. C., containing a population of 9,865 persons, was measured from 12.18 a. m. to 1.45 a. m., and amounted to 43,459 gallons, corresponding to a rate of 100 gallons per capita per day, at an hour of the night when the legitimate consumption should have been almost nothing.

#### USE OF WATER FOR MUNICIPAL PURPOSES.

For the first time in the history of the department careful observations, investigations, and measurements have been made for the purpose of determining the amount of water used in the District of Columbia for municipal purposes. It is believed that the desired information has been obtained with a fair degree of accuracy, the results being shown in the following statement:

	Gallons.
88 public schools .....	200, 707
District of Columbia building .....	6, 960
114 automatic flush basins .....	283, 141
Flushing and cleaning sewers and basins .....	156, 750
81 horse fountains .....	364, 376
Sprinkling streets and roads .....	257, 448
Flushing fire hydrants .....	500, 000

Total ..... 1,769,382

To this amount must be added the water used in—

Three market houses.

U street pumping station.

Ten police stations and police court.

Twenty engine and truck houses.

District of Columbia stables.

Jail, workhouse, and almshouse.

Industrial Home School.

Reform School for Girls, and by contractors doing work for the District of Columbia.

Careful estimates indicate these uses as amounting to 239,300 gallons per day, a total of 2,008,682 gallons per day for all municipal purposes, corresponding to a daily per capita of 7.2 gallons for each inhabitant of the District of Columbia.

The water used in the parks and reservations would, in most cities, very properly be charged to municipal consumption, but in the District of Columbia these public spaces are entirely under the control of United States authorities, and are therefore out of the jurisdiction of the municipal authorities of the District of Columbia.

From January 1 to May 4, 1900, meter readings were taken on 82 of the public school buildings in the District of Columbia, and some interesting statistics were obtained therefrom. The total number of pupils in these schools was 38,587. Forty of the buildings were equipped with dry closets and 42 with water closets. The average daily consumption per capita in the former case was 2.7 gallons; the maximum 32.2 gallons and the minimum 0.1 gallon; in the latter case the figures were 7.0, 44.7, and 0.4 gallons, respectively.

#### LEAKS.

During the year a rigid inspection was made for the purpose of detecting and classifying leaks due to defective fixtures. The results are shown in the following statement:

*Statement of inspections July 1, 1899, to June 30, 1900.*

Total number of premises inspected.....	108,364
Total number of premises in which leaks were found.....	11,452
Total number of leaking fixtures in one complete round of the District of Columbia.....	11,564
<hr/>	
Number of leaking fixtures of each class found in one complete round of the District:	
Hydrants.....	3,519
Closets.....	4,418
Faucets.....	3,627
Total.....	11,564

In addition all public hydrants and fire plugs in the District were inspected and the amount of leakage in each case was determined. The result of this inspection is given in the following statement:

Total number of public hydrants in use.....	333
Number found leaking on inspection.....	74
Average amount of leakage per day, each.....gallons..	247
Total amount of leakage.....do.....	18,306
Total number of fire hydrants in use.....	1,956
Number found leaking on inspection.....	29
Average amount of leakage per day, each.....gallons..	251
Total amount of leakage.....do.....	7,279

For several weeks past measurements have been made with a view to determining the average amount of leakage from hydrants, closets, and faucets on private premises. From the data available the leakage was found to average as follows: Hydrants, 1,120.5 gallons per 24 hours; closets, 1,115 per 24 hours; faucets, 76.9 per 24 hours.

Applying these figures to the number of leaking fixtures of each class found in one complete round of the District of Columbia, the total amount of leakage from defective fixtures on private premises is found to be 9,147,025 gallons per 24 hours. To this must be added 25,558 gallons per day, due to leakage from public hydrants and fire plugs, giving a total of 9,172,583 gallons, due to waste from defective fixtures. This corresponds to an average daily per capita of 32.9 gallons for each person in the District of Columbia, and if charged for at the very moderate meter rate of 3 cents per thousand gallons, would amount to \$275.18 per day, or \$100,439 per annum.

There are in the District of Columbia 370.9 miles of distribution mains under the control of the water department of the District. The amount of leakage from these mains and from house service pipes is as yet wholly indeterminate.

There are in use in the District of Columbia 1,135 water meters of twelve different approved makes, and 10 per cent of the total amount of Potomac water furnished is now metered.

I would respectfully recommend that the permanent force of inspectors be increased by the addition of two inspectors at a salary of \$900 per annum each; that two additional clerks be authorized in the water registrar's office, at \$1,200 each per annum, and that the salary of one of the \$1,400 clerks be increased to \$1,600 per annum. The increase in salary asked is for a clerk, who, in the absence of the water registrar, is required to act as chief clerk, and at other times performs duties of much responsibility.

Water main tax accounts are now kept in a very crude manner, the present system having been in use for many years, and much additional labor and increasing confusion results, all of which could be obviated by a change to a modern card system. I would therefore respectfully recommend that an appropriation of \$2,500 be requested for this purpose, the amount to be made immediately available.

#### SEWER DIVISION.

Under the appropriation for cleaning and repairing sewers and basins, 124,850 feet of pipe sewers, 9,699 feet of main sewers, 8,259 manholes, and 100,067 catch-basins were cleaned; 10,421 cubic yards of street detritus and sludge were removed from the sewers and basins; 519 feet of pipe sewers were constructed; 1,287 feet of pipe sewers were taken up and relaid; and 976 feet of main sewers were repaired. In addition to this work the usual reconstruction and repairs were made to catch-basins, outlets, manholes, etc., all of which are given in detail in the report of the superintendent of sewers, on page 40.

Wrought-iron sanitary wagons have been purchased to replace the wooden carts formerly hired for this purpose. A contract has been entered into for the construction of 600 feet of invert in the North Capitol street sewer, and the work under this contract is now in progress.

Under the appropriation for replacing obstructed sewers there were constructed, by day labor, 9,528 linear feet of pipe sewers from 8 to 24 inches in diameter, 1,233 linear feet of 6-inch lateral connections, and 59 manholes, practically completing the work of replacing those obstructed sewers not constructed in accordance with present methods. It is believed that the amount of this work which it will be necessary to execute in the future will be very small, and may be performed as repair work, necessitating no special appropriation for the purpose for the year 1902.

Three sections of main sewers were constructed under contract during the year. The locations of these sections are described in the report of the superintendent of sewers, on page 44.

5,320.15 linear feet of pipe sewers were constructed by contract, and in addition there were constructed by day labor 14,046.22 linear feet of sewers, 86 manholes, and 106 receiving basins.

From the appropriation for suburban sewers 5 sections of main sewers and 4,585.3 linear feet of pipe sewers were constructed under contract, and 5,712 linear feet of pipe sewers and 34 manholes were constructed by day labor.

Under the appropriation for assessment and permit work there were constructed 6,794 linear feet of pipe sewers under the permit system and 13,344.5 linear feet of pipe sewers under the assessment system.

Five automatic flushing basins were constructed during the year. Accurate gaugings were made of the 114 flushing basins now in service, to determine the quantity of water used in operating them. This amount was found to be 283,141 gallons per 24 hours.

Work under contract No. 2446 with J. K. Murphy is still in progress upon the Tiber Creek and New Jersey avenue high-level intercepting sewer, and at the close of the fiscal year 1,299 feet of sewer had been completed.

Work under contract No. 2632 with T. B. Jones & Co. was completed, 1,846 linear feet of sewer having been constructed. Until the outlet section has been completed it is impossible to connect this sewer with the Tiber sewer. During the progress of this sewer through Arthur place several houses settled badly, owing to their being constructed upon made ground, and in spite of the fact that the trench was well braced and every reasonable precaution taken to prevent such settlement. In the District appropriation act, approved June 6, 1900, the sum of \$18,000 was appropriated for the settlement of all damages and loss incurred by the construction of this

sewer, and it is hoped that an early adjustment of all claims for damages will be effected.

Owing to the fact that the bids received for the construction of the extension of the Boundary sewer exceeded the limit placed by Congress for this work, no work has been done during the fiscal year.

Contract No. 2743 with John Jacoby for the construction of the east side intercepting sewer was made, and work thereunder is still in progress, 1,555 feet of sewer having been constructed up to the close of the fiscal year.

I would strongly recommend approval of the suggestions made by the superintendent of sewers in regard to the lack of equity in assessments for the construction of service sewers. As the larger sewers are required to serve as outlets for the smaller sewers and as they are much more expensive than the latter, the practice of the office has been to construct sewers larger than 12 inches in diameter from the appropriation for main and pipe sewers or from that for suburban sewers, while sewers 12 inches and less in diameter are generally constructed under the assessment system, one-half of the cost being taxed against the abutting property. It therefore follows that property abutting upon sewers greater than 12 inches in diameter pays no taxes for the sewer, although receiving the full benefit therefrom. The assessment system also bears very unfairly upon owners of corner lots, the amount assessed against such a lot being sometimes several times as great as that assessed against an adjacent lot of equal area and receiving equal benefit. As suggested by the superintendent of sewers, it seems far more equitable that all property abutting upon a service sewer should pay a proportion of its cost, and it is believed that an assessment of \$7.50 for each 1,000 square feet of lot area would place such charges upon a fair basis.

I would also invite attention to and approve the recommendation of the superintendent of sewers as to the desirability of having appropriations for sewers so worded that they would be available until expended instead of lapsing with the fiscal year.

I would respectfully recommend that an effort be made to raise the limit of expenditure permissible by day labor from \$1,000 to \$3,000 in cases of emergency and repair work.

Studies of plans for the sewage pumping station have been made, the necessary preliminary data obtained, and a letter prepared inviting prominent architects to submit competitive designs for the station and its accessories.

The aggregate length of sewers constructed during the year was 13,969.24 linear feet (2.65 miles) of main sewer, and 51,966.85 linear feet (9.84 miles) of pipe sewers.

The total length of sewers in the District of Columbia is as follows: Main sewers, 88.3 miles; pipe sewers, 317.2 miles.

The operation of the sewer system has, with one exception, been quite satisfactory throughout the year. On June 2, 1900, a rainfall unprecedented in the history of the sewer division occurred; for a period of about forty minutes the rainfall was at the rate of 3.25 inches per hour. As a consequence many of the sewers were overcharged and considerable filling of cellars and basements occurred in certain localities. An inspection of the sewer system was made immediately thereafter with a view of ascertaining the amount of the overcharge, and endeavoring to prevent a recurrence of these conditions.

In connection with the consumption of water for municipal purposes, observations and measurements were made of the quantity of water used in flushing, by water carts and fire hose, the catch basins, and sewers, and the quantity used was found to be 156,750 gallons per day.

I desire to express my appreciation of the good work performed by the employees of the sewer division during the year.

#### PLUMBING DIVISION.

By reference to the report of the inspector of plumbing, page 67, it will be seen that the amount of work performed by the division of plumbing shows a considerable increase during the year just ended.

The approval of his office was given to designs for plumbing in 736 new buildings. The work of the office was largely increased owing to the fact that on December 6, 1899, the inspector of plumbing was charged with the work of inspecting yard hydrants of the "wasting" type. Nine hundred and thirty-three hydrants of this type have been replaced by new ones of the "nonwasting" type; 100 were entirely removed, and a large number were repaired.

Extensive revisions have been made in the plumbing regulations, principally in the regulations relating to house plumbing. These revisions will not take effect until January 1, 1901, after which time the number of necessary inspections will be increased. It is believed that the changes made in the regulations will secure a distinct advance in plumbing practice in the District of Columbia.

From the appropriation of \$25,000 for repairs to plumbing in public school buildings, extensive and very necessary changes have been made in plumbing in the Central High School, the Sumner, Banneker, and Grant school buildings. Small repairs in a number of other school buildings have also been made.

A set of 100 tracings has been prepared, showing in each case the boundaries of the school lot, the building located thereon, sewer, water, and gas connections, and the surrounding pavements and inclosures. During the year twenty-four cases involving violations of the plumbing regulations were taken into the police court, and fines were imposed in all cases.

#### PLUMBING BOARD.

Forty-one sessions of the plumbing board were held, 16 of which were devoted to revisions of the plumbing and gas-fitting regulations. Thirty-six applicants for licensing as master plumber and gas fitter were examined during the year, 13 of whom passed successful examinations and were recommended for license.

Written examinations have been substituted for oral ones since June 6. The board of examiners consider it desirable that a practical demonstration of the candidate's skill as a plumber should be given. They therefore request that the necessary appliances be provided and a room fitted up for this purpose. Such tests seem very desirable, and I would recommend approval of their request.

I would also recommend that the field force of the plumbing division be increased by the addition of one inspector at \$1,000 per annum, in order that proper attention may be given to the making of final tests of plumbing work and to the careful execution of such work in the municipal buildings of the District of Columbia.

#### BUILDING DIVISION.

During the year 892 new buildings were erected and 1,520 buildings were repaired. During the preceding year these numbers were 1,056 and 1,499, respectively, showing a decrease of 164 in new buildings and an increase of 21 in repairs as compared with the figures for the fiscal year ending June 30, 1899. Although the number of new buildings showed a decrease, yet the value of these buildings was \$1,250,000 greater than that of the preceding year, indicating a better class of structures.

It will be noted from an inspection of the report of the inspector of buildings that there has been a marked decrease in the number of dwellings erected and an increase in the number of apartment houses.

During the year the assistant inspectors of buildings made 6,729 visits to new buildings in course of erection, 2,516 visits to old buildings in course of alteration or repair, and 3,446 visits of a miscellaneous character, aggregating 12,691 visits in all, an increase of 322 visits over the aggregate for the preceding year.

Increased vigilance has been exercised in the inspection of dangerous buildings and portions thereof, with the result that for the past year 616 condemnations were made, as compared with 120 for the year ending June 30, 1899.

For further details as to the nature and value of the various buildings erected during the fiscal year I would invite attention to the report of the inspector of buildings on page 69.

There were, during the year, available for inspection service in the field four assistant inspectors of buildings and one assistant inspector of elevators, fire escapes, steam-heating appliances, boilers, and engines. The area to be covered by these five inspectors is about 62 square miles, and the maximum number of buildings in course of erection at one time is about 500, while at the same time the maximum number of repairs requiring constant inspection is about 100, giving a total of about 600 constructions in progress during the busiest season. Proper supervision can not be exercised unless each locality where a building is being constructed or repaired is visited at least two or three times a week, requiring, say, 1,500 visits per week. To these must be added about 70 visits of a miscellaneous character per week. It is evident, therefore, from what precedes that the present force is totally inadequate to give proper inspection to the buildings in course of erection and repair in this city, notwithstanding the fact that the assistant inspectors, as a rule, work overtime in their efforts to relieve the present condition of affairs, and are seldom able to avail themselves of the privilege of leave accorded to other employees of the District of Columbia.

Section 202 of the building regulations requires that every elevator in the District of Columbia used for the conveyance of passengers shall be inspected at least once in every three months, but as there is but a single assistant available for the inspection of elevators, fire escapes, steam-heating appliances, boilers, and engines, it is manifestly impossible to carry out this wise provision of the building regulations.

During the year just ended 29 elevators were installed and 912 elevators were

inspected. Seven elevators were condemned during installation and 285 were condemned and ordered to be repaired. These figures indicate clearly the necessity of more frequent inspection.

Two school buildings, one isolation ward in the grounds of Providence Hospital, and one building as an addition to the almshouse have been completed during the year. The truck house in West Washington will probably be completed during the month of August, 1900.

Plans for all of these buildings were prepared by prominent architects in the city of Washington, acting in conjunction with the inspector of buildings, and the result has been a decided improvement from an architectural point of view.

Plans and specifications for 25 new municipal buildings must be prepared during the ensuing year, and as the law requires that the plans and specifications for all of these buildings shall be prepared under the supervision of the inspector of buildings, much work will devolve upon the office in connection therewith.

In certain sections of the city a personal inspection showed that the bricks being used in the construction of buildings were frequently of poor quality; that an excessive number of broken brick were being used, and that the character of the foundations, the brickwork in general, and the flue construction in particular were in many cases not in accordance with regulations. Every effort has been made to remedy this condition of affairs, and already a marked improvement in these respects has been noted.

Considerable trouble is experienced from the fact that the bricks used in the District vary greatly in size, and I would recommend that a limit be fixed as to the amount of variation permissible in the size of bricks used in the same wall, and that a limit also be fixed as to the percentage of broken brick which may be used in any one course of a wall.

During the past year members of the builders' exchange and others interested in building construction have called attention to the time consumed in the office of the inspector of buildings in obtaining permits, but owing to the small force authorized in that office it has been impossible to afford the relief requested.

It would appear that the enforcement of regulations relating to the electric wiring of buildings should be placed under the charge of the electrical engineer of the District, and I would respectfully recommend that this be done, and that the regulations relating thereto be stricken from those governing the building department, and that suitable regulations governing this subject and conforming to the latest practice in modern cities be provided and enforced by the electrical engineer.

The last edition of the building regulations is exhausted, and constant applications are being made for new copies. Before a new edition is printed it seems very desirable that the regulations should be revised by a competent board. If this be done I would recommend that the amendments suggested in the report of the assistant inspector of elevators be referred to the board for consideration.

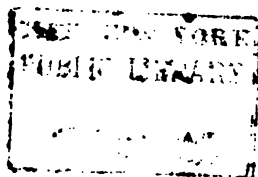
In view of the fact stated in this report and in the reports of the inspector of buildings and his assistants, it must be evident that a substantial increase in the force of the building department is absolutely necessary for the proper performance of the important duties devolving upon that department. In addition to the force now employed therein, I would respectfully recommend that the following increases be included in the estimates for the next fiscal year: One clerk at \$1,200 per annum and four assistant inspectors of buildings at \$1,500 per annum, each; and I would further recommend that the salary of the principal assistant inspector of buildings be increased from \$1,600 to \$1,800 per annum. In explanation of the salaries requested for the four additional inspectors of buildings, I would state that it is extremely desirable that the office should have in its employ at least four graduate civil engineers, practically familiar with building construction, as complex questions involving technical engineering knowledge continually arise and must be dealt with intelligently. It is evident that the services of suitable men of the class desired can not be obtained for a less amount than that recommended.

I desire to express my appreciation of the earnest efforts made by the employees of the building department to accomplish the large amount of work which devolves upon them.

#### BUILDING REPAIRS.

Repairs were made during the year to 113 public school buildings, 4 manual training schools, 9 police stations, 20 engine and truck houses, and 13 miscellaneous buildings. For the details of these repairs see the report of the superintendent of repairs, pages 75 and 76.

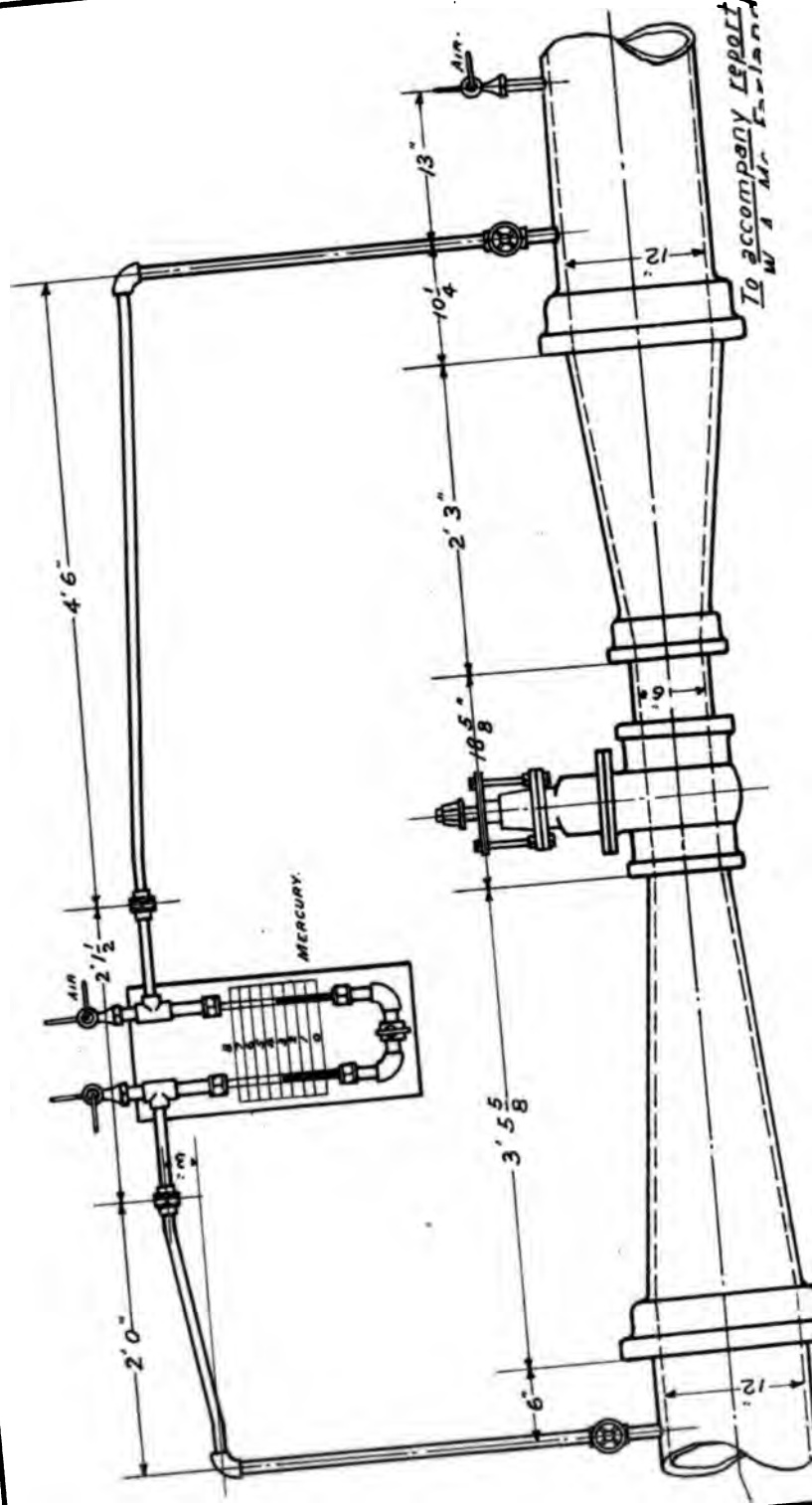
The work of the repair division is hampered by lack of a suitable repair shop and storage yard, and it is extremely desirable that the present inadequate rented structure be replaced by a suitable shop and yard, where repair materials can be stored.



100-100000

100-100000

# **DEVICE FOR MEASURING LOSS OF LIQUIDS**



To accompany report of  
W. A. McFarland

with safety in bulk, and where proper shop machinery can be installed. The importance of the repair division warrants the purchase of a lot and the erection thereon of a repair shop adapted to the needs of the District. I would respectfully recommend that an appropriation of \$15,000 be included in the estimates for the next fiscal year for this purpose.

Respectfully submitted.

D. D. GAILLARD,  
*Captain, Corps of Engineers, U. S. A.,*  
*Assistant to Engineer Commissioner D. C.*

Capt. LANSING H. BEACH,  
*Corps of Engineers, U. S. A.,*  
*Engineer Commissioner District of Columbia.*

#### REPORT OF THE SUPERINTENDENT OF THE WATER DEPARTMENT.

WASHINGTON, July 25, 1900.

CAPTAIN: I have the honor to submit the following summary of work done by the distribution branch of the water department for the fiscal year ending June 30, 1900:

For a statement of mains laid and their cost, together with other routine work, attention is invited to the accompanying tables, which are self-explanatory. As will be seen, the total length of new mains laid, of all sizes, was 73,059 feet, or a little less than 14 miles.

The most important work of the year was the completion of the south basin of the new Brightwood reservoir, which was first filled with water on January 7, 1900, and which has since been continually in use except for about a week in May, when it was emptied for examination and cleaning.

As is shown on the accompanying plans,<sup>1</sup> this reservoir is a concrete basin with walls built up in sections of about 50 feet in length and with vertical keyways 6 inches square in plan introduced between adjacent sections. These keyways were filled with tempered clay, well rammed in, for the purpose of making a water-tight joint. For some time after the basin was filled there was considerable leakage through these joints, especially in the dam; this leakage has, however, steadily decreased, and is now almost inappreciable.

A contract has been made for the completion of the north basin, and the work of excavation has begun.

For the purpose of connecting this reservoir with the existing trunk mains of the "middle service," 10,902 linear feet of 36-inch cast-iron main was laid at a total cost of \$70,171.21, or \$6.47 per linear foot, including all gates and fittings, but exclusive of the cost of repairing roadways.

On this 36-inch pipe line were placed four divide valves, each only 20 inches in diameter, it being believed that the slight loss of head resulting from this contraction in the size of the main would be more than compensated for in greater ease of manipulation of gates; there was also some saving in first cost. Before deciding on this feature of the pipe line a number of experiments were made to determine the loss of head resulting from the placing of a 6-inch gate on a line of 12-inch pipe, and connected therewith by conical reducers. The accompanying sketch shows the manner in which the loss of head was measured; the results obtained are also shown graphically. Judging from these results it was believed that the loss caused by placing a 20-inch gate on a 36-inch line would be insignificant at the rates of flow which would obtain in ordinary practice. These gates were, therefore, used, being connected with the main by means of conical reducers, each 8 feet in length.

On April 25 a series of somewhat crude experiments was made to determine actual loss of head at these 20-inch gates, the normal flow being much increased by partially opening two 16-inch blow-off gates below the gate at which the test was being made. The results obtained, the mean of two groups of observations, are shown graphically on the accompanying diagram, and are believed to be approximately correct. More careful experiments will be made later with an apparatus using water and air in place of mercury and water.

The greatest rate at which water flows from the reservoir to the city under present conditions is about 12,000,000 gallons in 24 hours, or 11.20 cubic feet per minute. This would give a loss of head at each gate of 0.31 foot, or a total loss for the four gates of 1.24 feet. After certain contemplated changes have been made in the water-distribution system of the city, the territory to be supplied from this reservoir will be much reduced and the maximum rate of flow will not exceed 6,000,000 gallons in 24 hours, giving a loss of head at each gate of 0.09 foot.

<sup>1</sup> Not printed.

## 22 OPERATIONS OF THE ENGINEER DEPARTMENT, D. C.

The completion of the Brightwood reservoir permits of nearly all pumping being done at night, thus relieving the low-service mains of a very heavy draft—at least 350,000 gallons per hour during the daytime. This results in an increase of from 6 to 8 feet in the head of water available on Capitol Hill between 7 a. m. and 4 p. m., at which latter hour it is usually necessary to start one of the large pumps. There is, of course, a corresponding decrease in the head available over a part of the gravity system at night.

There have been no changes of importance at the U street pumping station during the year, except the equipping of two boilers with Roney mechanical stokers, and of two with the Hawley down-draft furnaces. The chief object of these changes was to prevent the emission of smoke from the pump-house stack and incidentally to obtain greater economy in fuel consumption; in both respects the installation has been successful.

The following are the principal data of interest from the pumping station records:

Water pumped during year:		
Middle service .....	million gallons..	2, 427. 5
High service.....	do.....	75. 4
Total.....	do.....	2, 502. 9
Water pumped per day, mean:		
Middle service .....	gallons..	6, 651, 000
High service.....	do.....	206, 600
Total.....	do.....	6, 857, 600
Mean total head pumped against—		
Middle service.....	feet..	162
High service.....	do.....	355
Equivalent quantity of water pumped against a head of 100 feet:		
Middle service.....	gallons..	10, 775, 000
High service.....	do.....	733, 000
Total.....	do.....	11, 508, 000
Coal burned during year .....	pounds..	4, 440, 000
Coal burned per day, mean .....	do.....	12, 160
Cost of coal during year .....		\$4, 413. 86
Cost of coal per day, mean .....		\$12. 09

### *Cost of pumping during year.*

Running expenses at station—		
Labor .....		\$12, 052. 74
Coal.....		4, 413. 86
Oil .....		598. 04
Waste .....		202. 81
Miscellaneous supplies.....		706. 62
Material used in repairs.....		774. 30
Total .....		18, 748. 37
Per day, mean .....		\$51. 37
Cost of land.....		2, 275. 00
Cost of building .....		30, 000. 00
Cost of machinery.....		75, 000. 00
Total .....		107, 275. 00
Interest at 3 per cent .....		3, 218. 25
Per day .....		\$8. 82
Depreciation on building and machinery—3 per cent on \$105,000 .....		3, 150. 00
Per day.....		\$8. 63
Grand total.....		25, 116. 62
Per day.....		68. 82

Total cost per 1,000 gallons under actual conditions .....	cents..	1.003
Cost per 1,000 gallons, pumped 100 feet high .....	do.....	.598
Cost per 1,000 gallons under actual conditions, exclusive of interest on investment and depreciation of plant .....	cents..	.749
Cost, exclusive of interest on investment, but including 3 per cent depreciation .....	cents..	.875

Weight of coal, per 1,000 gallons, under actual conditions ..	pounds..	1.773
Weight of coal, per 1,000 gallons, pumped 100 feet high .....	do.....	.9967

Coal used, a very poor quality of West Virginia semibituminous.

Cubic feet of water per day pumped 100 feet high .....		1,538,500
Weight, at 62.4 pounds .....		96,002,000
Foot-pounds per day .....		9,600,200,000
Foot-pounds per minute .....		6,667,000
Effective horsepower .....		202
Indicated horsepower, assuming mechanical efficiency of 85 per cent ..		238
Cost per effective horsepower per year, including interest and depreciation .....		\$124.30
Cost per indicated horsepower per year, including interest and depreciation .....		\$105.53
Coal per indicated horsepower per hour, mean for whole year ..	pounds..	2.13

As is to be expected, the trouble caused by defective water pressure is steadily increasing, being greatest on that part of Capitol Hill adjacent to the 12-inch main used to supply the navy-yard. This local trouble has been in part corrected by the laying of a 12-inch main south on Sixth street, from East Capitol street to E street, and will be still further improved by the laying of a 12-inch main south on Tenth street, from East Capitol street to I street. When this second main is completed, the supply to the navy-yard can be entirely separated from that for domestic purposes, which should result in the improvement of both services.

In accordance with the instructions of the Engineer Commissioner, Capt. Lansing H. Beach, U. S. A., I prepared a general project for the rearrangement of the water distribution system of the District of Columbia and submitted a report thereon, as follows:

WASHINGTON, January 6, 1899.

CAPTAIN: I have the honor to submit the following project for rearrangement of the system of water distribution for the District of Columbia, together with an estimate of cost, which, in advance of detailed plans, is necessarily only roughly approximate.

The present condition of affairs is very unsatisfactory and gives rise to many and just complaints of inadequate service; the trouble is almost wholly confined to the area supplied by gravity flow from the distributing reservoir west of Georgetown.

While the completion of the new aqueduct tunnel and reservoir will no doubt improve conditions somewhat, at the best this increased supply can not be expected to raise the water more than 15 or 20 feet above its present level, and this would by no means give a satisfactory supply for either domestic purposes or fire protection on Capitol Hill and the higher parts of the northwest section.

It is assumed that a minimum of 30 pounds per square inch, or a head of 70 feet at curb level is desirable, and in the following plan a range of pressures from 30 pounds minimum to 60 pounds maximum is taken as a basis.

For this purpose the District is divided as follows:

First. Area to be supplied by gravity. This includes all the territory having an elevation of less than 70 feet above tide.

Second. First high-service area, including that between 70 feet and 140 feet above tide.

Third. Second high-service area, between 140 feet and 210 feet.

Fourth. Third high-service area, between 210 feet and 360 feet; and, finally,

Fifth. A small area (about 1.1 square miles) between 360 feet and 420 feet, which is too high for a satisfactory supply from the third high service.

The ground included in these several districts can be best understood by inspection of the map.

In determining the sizes of mains and for the high-service areas, of pumps, the following data are assumed:

A population of 30,000 per square mile in the thickly settled portions and a total population of about 500,000.

A daily per capita supply of 200 gallons and water for 30 simultaneous fire streams of 250 gallons per minute each.

Under these conditions the mean daily flow in the District would be 100,000,000 gallons, or about 32 per cent in excess of the ultimate capacity of the present conduit from Great Falls. But it is found that during the hour of greatest consumption the rate of flow is about 1.8 times the mean; also, 30 fire streams of 250 gallons per minute each equal 7,500 gallons per minute, or at the rate of about 11,000,000 gallons in 24 hours. Therefore, under the extreme conditions assumed, that of maximum consumption and a large fire occurring simultaneously the rate of flow would amount to about  $(100,000,000 \times 1.8) + 11,000,000 = 191,000,000$  gallons in 24 hours, or about 8,000,000 gallons per hour.

As will be shown later, about one-half of the supply to the gravity area only will flow through the existing mains from the distributing reservoir, and the remainder, except that to part of the third and fourth high service, through the new aqueduct tunnel and reservoir, the completion of which is essential to any satisfactory system, and is assumed.

#### GRAVITY SYSTEM.

This, as before stated, to include all territory having an elevation less than 70 feet above tide.

In addition to the water needed for the supply of this area, all for that part of the District lying east and south of the Eastern Branch must pass through the low-service mains, necessitating a further increase in their size.

Total area in Washington to be supplied by gravity, 5.960 square miles. Present population, 150,000.

Total area east of Eastern Branch, 14 square miles; total present population, 11,000.

This area in the city being already well built up, the relative increase in population will be less than for some other parts under consideration.

A total population of 220,000 on the gravity area is assumed.

Under extreme conditions, as given above, the maximum rate of flow would be  $(220,000 \times 200 \times 1.8) + 11,000,000$  gallons = 90,000,000 gallons in 24 hours.

Mean rate, 44,000,000.

The existing supply mains to the city from the distributing reservoir are one 48-inch, one 36-inch, and one 30-inch. The 12-inch is disregarded.

These are about 10,000 feet long to Rock Creek.

Assuming that two 48-inch mains will be laid from the Howard University Reservoir to New Jersey avenue and M street to reinforce the gravity supply, we have the following conditions to determine approximately the relative amount of water reaching the gravity area from the two sources:

Elevation of distributing reservoir, 146.

Assumed elevation of Howard University Reservoir, 143.

One 48-inch main, 10,000 feet long.

One 36-inch main, 10,000 feet long.

One 30-inch main, 10,000 feet long.

Two 48-inch mains, each 7,000 feet long.

Assume total loss from friction in long mains to be 8 feet, or 0.8 foot per 1,000 feet length.

Then for the short mains from Howard University Reservoir for equal terminal pressures allowable total loss equals 5 feet, or 0.7 foot per 1,000 feet length.

From Weston's tables of friction in cast-iron pipes we have following capacities, with total loss of head of 0.8 foot per 1,000 feet:

30-inch .....	7,800,000
36-inch .....	12,400,000
48-inch .....	25,300,000
	<hr/>
	45,500,000
And with 0.7 foot per 1,000 feet:	
48-inch .....	24,000,000
48-inch .....	24,000,000
	<hr/>
	48,000,000

Or a total of 93,500,000 gallons in 24 hours.

This corresponds fairly well with our assumption of 90,000,000 gallons under extreme conditions.

Doubling friction loss for deterioration of mains we have a probable head at Pennsylvania avenue and Rock Creek and at New Jersey avenue and M street, under assumed conditions, of  $146-16=130$ .

Under ordinary conditions it is believed that the head at these points would not be less than 138 or 140 feet.

It seems from the above that about equal amounts of water would reach this area from the distributing reservoir and from that near Howard University.

In estimating the location and sizes of necessary trunk mains to supply the gravity area, the following plan was followed, no attention being paid in the preliminary work to the location of existing mains:

Lines were drawn from the two sources of supply as nearly as practicable through the middle of the gravity areas and lines for secondary trunk mains drawn from the first lines, as shown on sheet No. 1<sup>1</sup> herewith.

In estimating the sizes of the mains the territory to be supplied from each was subdivided into convenient areas, these measured by planimeter and a maximum supply estimated for a population of 30,000 per square mile at a rate of 360 gallons per capita per diem, plus the amount necessary for fire streams.

The amount to be supplied at a given point being thus estimated, the size of main necessary to carry it with a friction loss of head of from 1 foot to 1.5 feet per 1,000 feet was taken from Weston's tables of "Friction of water in pipes."

The loss of head is but one-half of that allowable under conditions stated for maintenance of about 30 pounds per square inch at curb level, thus leaving a margin of 1 to 1.5 feet friction loss for deterioration of pipes.

While the above provides for but 30 fire streams, this is under the condition that good service pressures are simultaneously maintained over the whole gravity area under extreme conditions of domestic supply.

The use of a greater number of streams would simply result in a temporary decrease of service pressures along the line of the trunk mains feeding them, and this decrease would occur only if the need for fire streams occurred during the hour of maximum general demand.

As before stated, all water for Anacostia must pass through the gravity mains of Washington. Assuming an increase of population from the present 11,000 to 30,000, and the need of 15 fire streams, we have a maximum rate of flow to this section of about 16,000,000 gallons in 24 hours. As indicated on sheet 1,<sup>1</sup> this will require a main 36 inches in diameter. This additional amount is provided for in the mains from the new reservoir, passing north and south of Capitol Hill.

Sheet No. 2<sup>1</sup> shows a modification of proposed new mains, to utilize as far as possible the existing lines. In this connection the following table of comparative capacities, taken from Weston's tables of friction, may be of interest:

[Capacity in gallons in 24 hours, with loss of head of 1 foot per 1,000 feet new pipe.]

Size of main.	Capacity.	Size of main.	Capacity.
48 inches .....	29,000,000	16 inches .....	1,850,000
36 inches .....	14,000,000	12 inches .....	880,000
30 inches .....	8,900,000	10 inches .....	550,000
24 inches .....	5,100,000	8 inches .....	300,000
20 inches .....	3,200,000	6 inches .....	149,000

Principal trunk mains only are indicated.

Following are lengths and sizes as platted on sheet No. 2:<sup>1</sup>

	Linear feet.
48 inches .....	25,000
42 inches .....	22,500
36 inches .....	20,000
30 inches .....	3,000
24 inches .....	3,300
20 inches .....	7,200
16 inches .....	9,000

90,000=17½ miles.

<sup>1</sup> Not printed.

An approximate estimate of the cost of the above mains, including valves and replacing payments, is as follows:

25,000 feet 48-inch, at \$16 .....	\$400,000
22,500 feet 42-inch, at \$13 .....	292,500
20,000 feet 36 inch, at \$11 .....	220,000
3,000 feet 30-inch, at \$9 .....	27,000
3,300 feet 24-inch, at \$6 .....	19,800
7,200 feet 20-inch, at \$4 .....	28,800
9,000 feet 16-inch, at \$3 .....	27,000
	<hr/>
	1,015,100

As stated, all of the above is on the basis of a mean supply of 200 gallons per capita per diem, a rate which will soon be reached unless radical measures be taken to curtail the wholly useless waste, which is undoubtedly responsible for at least one-half of the total consumption.

The experience of many other communities goes to show that excessive waste of water can be prevented only by the general adoption of meters on domestic service, and that such metering will result in reducing the consumption and waste of water to less than 100 gallons per capita per diem. With a total of 100 gallons per capita the size of trunk mains on the gravity service might be reduced in capacity by about 30 per cent, when we should have the following:

25,000 feet 42-inch, at \$13 .....	\$325,000
22,500 feet 36-inch, at \$11 .....	247,500
20,000 feet 30-inch, at \$9 .....	180,000
3,000 feet 24-inch, at \$6 .....	18,000
10,500 feet 20-inch, at \$4 .....	42,000
9,000 feet 16-inch, at \$3 .....	27,000
	<hr/>
	839,500

Showing a saving of \$175,600.

First high-service area, including territory having an elevation between 70 and 140 feet above mean tide level.

This area includes Capitol Hill, most of the northwest section between Massachusetts avenue and Florida avenue, about one-half of Georgetown, and some  $4\frac{1}{2}$  square miles east and northeast of Eckington and Brookland.

Owing to the difficulty of finding a suitable location for a reservoir for this area it is recommended that a system of direct pumping similar to that now in use on the "middle service" be adopted. This of course will necessitate a larger pumping plant than would be needed with a reservoir system, but the increased cost of plant and maintenance will be largely offset by saving on reservoir and long force mains.

It is recommended that the pumping station be located nearly over the line of the new aqueduct tunnel, just west of Seventh street, and that connection be made from the tunnel to the suction well of the pumps by means of a short lateral tunnel and vertical shaft, both of masonry.

At the location suggested the water from the tunnel will rise to a convenient height for this purpose, and all necessity for disturbing the embankments of the new reservoir will be avoided. It is also suggested that an alternate connection between the source of supply and the suction well be made by means of a 48-inch main from the end of the 75-inch main at Fourth and College streets. This would be used only in case the tunnel was closed or the regular feed line became deranged.

The total area to be supplied by the pumps on the first high service is about  $8\frac{1}{2}$  square miles, distributed as follows:

	Square miles.
Georgetown .....	0.42
City west of Eckington .....	2.25
Capitol Hill .....	1.14
Eckington to Montello .....	2.05
Northeast of Montello .....	2.62
Total .....	<hr/> 8.48

In estimating the ultimate supply needed for this section a population of 30,000 per square mile is assumed for all west of Eckington; of 15,000 between Eckington and Montello, and of 10,000 beyond Montello, in all, about 171,000. Maximum rate of flow in 24 hours,  $171,000 \times 200 \times 1.8 = 61,500,000$ ; adding 10,000,000 for fires; total, 71,500,000.

The mains indicated on the map are estimated on this basis and the new ones needed to fulfill the conditions aggregate as follows:

3,500 feet 20-inch, at \$4 .....	\$14,000
2,200 feet 24-inch, at \$5.50 .....	45,100
1,600 feet 30-inch, at \$8 .....	60,800
1,000 feet 36-inch, at \$10 .....	340,000
1,300 feet 48 inch, at \$16 .....	148,800
Total .....	608,700

Many of these mains would not be needed at once if this system were adopted.

The present population over the area described is about 100,000, and the mean per capita daily consumption and waste does not exceed 165 gallons.

$16,500,000 \times 1.8 = 29,700,000$  gallons; adding 5,000,000 for extinction of fires, we have a total rate to be provided for of about 35,000,000.

This would be well covered by an installation of three 12,000,000-gallon pumping engines, which would work against a pressure of about 35 pounds per square inch—the head necessary to give a minimum of about 30 pounds per square inch at curb level.

The only large mains immediately needed, if this general system were adopted, would be a 48-inch from the pump house south on Eighth street to R street, a 42-inch from R to K streets, and a 36-inch from K to East Capitol and Third streets, as shown on map herewith.

Second high service, lying between 140 feet and 210 feet.

#### ELEVATION.

Total area suitable for building, about  $4\frac{1}{2}$  square miles. Assuming a population of 20,000 per square mile, total population to be provided for, 90,000.

As this area is to be supplied through a reservoir, the mean rate only need be provided for in estimating pump capacity:  $90,000 \times 200 = 18,000,000$  gallons in 24 hours.

The present population, however, is but 20,000, and the per capita rate does not exceed 165 gallons per diem. Therefore, the pump capacity at present needed, if the general system outlined be adopted, would be only  $20,000 \times 165 = 3,300,000$  gallons in 24 hours.

The mains for the supply of this area, as shown on the map, are calculated for the greater supply. They aggregate as follows:

12,000 feet 36-inch, at \$10 .....	\$120,000
30,200 feet 30-inch, at \$8 .....	241,600
4,000 feet 24-inch, at \$6 .....	24,000
1,000 feet 20-inch, at \$4 .....	4,000
	389,600

Third high-service area, between 210 and 360 feet.

#### ELEVATION ABOVE TIDE.

This area, including the greater part of the ground of the Soldiers' Home and of Rock Creek Park, amounts to about  $13\frac{1}{2}$  square miles, for the most part thinly settled.

It is at present supplied from the reservoir at Reno by means of the long 12-inch mains.

Owing to the length of these mains and consequent great frictional resistance, it is impracticable to pump from the U street station a greater amount than about 1,500,000 gallons in 24 hours.

For the same reason the delivery at the higher parts of Petworth with the present system would scarcely exceed 1,000 gallons per minute, or enough for about four good streams for fire purposes.

The cost of laying a 36-inch main from Reno to Petworth would probably not be less than \$260,000.

For these reasons it is suggested that a 36-inch main be laid from the proposed pump house to connect with the end of the present 12-inch main in Petworth. By this arrangement the reserve supply from Reno will be available for ordinary domestic use, and direct high-pressure pumping from the station can be resorted to in case of a serious fire. Extensions would be made as needed.

Owing to the proximity to the reservoir of that part of the third high-service area north and south of Reno, the reservoir alone can be depended upon to provide it with adequate fire service.

When the amount of water used on this service warrants it, a pumping station

could advantageously be established near the distributing reservoir and a direct-force main laid from this station to Reno Reservoir.

Fourth high service. This includes the summit west of Rock Creek, having an elevation greater than 360 feet and an area of a little more than 1 square mile.

For furnishing this area with an adequate water pressure the erection of a 30,000-gallon tank and small pump adjacent to Reno Reservoir is recommended. Elevation of surface of water in tank to be 460 feet above tide, or about 40 feet above the present high-water level in Reno Reservoir.

Fire hydrants, except two or three on the extreme summit, should be connected with the mains of the third high-service system.

Following is a summary of work necessary for completion of the general system recommended:

## MAINS.

## Gravity system:

48-inch, 25,000 feet, at \$16	\$400,000
42-inch, 22,500 feet, at \$13	292,500
36-inch, 20,000 feet, at \$11	220,000
30-inch, 3,000 feet, at \$9	27,000
24-inch, 3,300 feet, at \$6	19,800
20-inch, 7,200 feet, at \$4	28,800
16-inch, 9,000 feet, at \$3	27,000

## First high-service system:

48-inch, 9,300 feet, at \$16	148,800
36-inch, 34,000 feet, at \$10	340,000
30-inch, 7,600 feet, at \$8	60,800
24-inch, 8,200 feet, at \$5.50	45,100
20-inch, 3,500 feet, at \$4	14,000

## Second high-service system:

36-inch, 12,000 feet, at \$10	120,000
30-inch, 30,200 feet, at \$8	241,600
24-inch, 4,000 feet, at \$6	24,000
20-inch, 1,000 feet, at \$4	4,000
36-inch, 7,500 feet, at \$11	82,500

2,095,900

say \$2,100,000. This includes 20 per cent for contingencies. The ultimate cost of pumping station would no doubt reach \$500,000, making a total estimated cost of completed system \$2,600,000.

Much of this work would not be needed for many years, but the general system could be put in use in three or four years, or by the time the new Washington Aqueduct extension is completed. All of the foregoing is, of course, contingent on the successful completion of this extension.

The necessary work would be as follows:

- (1) Building of Brightwood reservoir;
- (2) Completion of 36-inch main from Brightwood reservoir to pump house;
- (3) Building of pump house and installation of three 12,000,000-gallon high-duty pumping engines;
- (4) Forty-eight-inch main from new pump house to R street, 42-inch main from R street to K, and 36-inch main from K street to Third and East Capitol streets, to supply Capitol Hill;
- (5) Removal of pumps from U street to new station;
- (6) Erection of tank and small pump at Reno.

This would give a greatly improved service, and further extensions could be made as funds became available.

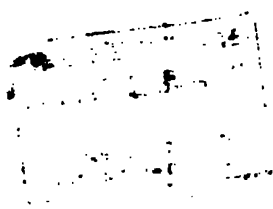
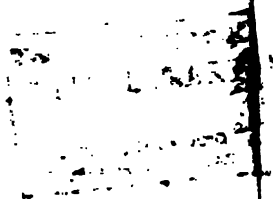
Following is an approximate estimate of the cost of this work:

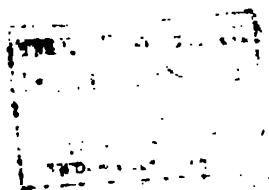
Brightwood reservoir	\$113,000
36-inch force main	120,000
4,000 feet 48-inch main, at \$16	64,000
3,500 feet 42-inch main, at \$13	45,000
8,000 feet 36-inch main, at \$11	88,000
New pump station	225,000
Removal of pumps	5,000
Installation at Reno	2,000

662,500

Miscellaneous 38,000

700,000





The locations of mains as shown on the accompanying maps would, no doubt, be subject to slight changes due to local conditions; this can not be determined until detailed plans are worked out.

The adoption and execution of this general system would, I believe, give permanently satisfactory water pressures over the whole District.

If it be approved, I would respectfully urge that the work be begun at an early date and carried forward as funds become available.

Very respectfully, your obedient servant,

W. A. MCFARLAND,  
*Superintendent Water Department.*

Capt. LANSING H. BEACH,  
*Corps of Engineers, U. S. A., Engineer Commissioner, District of Columbia.*

After this report was submitted it was learned that Lieut. Col. A. M. Miller, Corps of Engineers, U. S. A., in charge of the Washington Aqueduct extension, planned to locate the projected filtration plant for the entire city supply in the vicinity of the new Howard reservoir. The carrying out of this plan will necessitate the drawing of the entire supply for distribution from the eastern end of the new tunnel.

On November 4, 1899, a report supplementary to that of January 6, was submitted, as follows:

WASHINGTON, November 4, 1899.

CAPTAIN: I have the honor to submit the following project for a rearrangement of the water-distribution system of the District of Columbia; this is supplementary to the report sent to the Engineer Commissioner on January 6, 1899, and is arranged with a view to drawing the entire water supply from the new Howard University reservoir.

The first, second, and third high-service systems remain practically the same as described in the report above referred to, the only essential change being the location of the pumping station just south of the new reservoir. On this map the various areas are outlined. They are as follows:

First. Low, or gravity service, all territory lying at an elevation of less than 70 feet above tide.

Second. First high service, between elevations of 70 and 140 feet.

Third. Second high service, between elevations of 140 and 210 feet.

Fourth. Third high service, between elevations of 210 and 360 feet.

Fifth. Fourth high service (not shown on accompanying map), above an elevation of 360 feet.

*Gravity area.*—In the original project it was proposed to supply this area through existing mains (48, 36, and 30 inch) from the west, and two new 48-inch mains south from the new reservoir. If, however, the entire supply be drawn from the new reservoir, we shall lose this supply from the west. In order to compensate for this the present project provides for three 48-inch mains south from the reservoir, as indicated. As before stated, the conditions governing the areas supplied by pumping are the same as described in the report of January 6, 1899.

In order to put this general system in operation the following specified work would be necessary:

The building of a pumping station south of the new reservoir.

The purchase and erection of two 15,000,000-gallon pumping engines.

The laying of 4,200 linear feet of 48-inch main, 15,000 linear feet of 36-inch main, and 2,000 linear feet of 12-inch main, with necessary gates and fittings.

The removal of pumps from the U street pump house to the new pumping station and the erection of a tank and small steam or electric pump near Reno reservoir.

The several areas would then be supplied as follows:

Gravity, by 48, 36, and 30 inch mains from the west, and by existing 48-inch main from the new reservoir.

First high service, by 48-inch main from pump house, east on Baltimore street, south on First street, west to R street, and here dividing into two 36-inch mains, one to Capitol Hill and one connecting with existing 48-inch main on R street.

Second high service, by 36-inch main from pump house, west on College street and Grant and Florida avenues, to Thirteenth street, and here connecting with existing 24-inch main to Brightwood reservoir.

Third high service, by main from pump house, west on College and south on Seventh streets, connecting with existing 12-inch main on Florida avenue and thence to Reno reservoir.

## 30 OPERATIONS OF THE ENGINEER DEPARTMENT, D. C.

The estimated cost of the foregoing is as follows:

Pump house and new pumps .....	\$300
4,200 feet 48-inch main, at \$16 .....	67
15,000 feet 36-inch main, at \$11 .....	165
2,000 feet 12-inch main, at \$1.50 .....	3
Removal of pumps .....	2
Installation at Reno .....	5
<b>Total .....</b>	<b>543</b>
Miscellaneous .....	56
<b>Grand total .....</b>	<b>600</b>

The preliminary estimate for the complete project remains about the same as given in the report of January 6, 1899. For the reasons given in that report it is suggested that immediate action be taken toward the adoption of this or some other project for the rearrangement of the distribution system of the District.

Very respectfully,

W. A. MCFARLAND,  
Superintendent Water Department

Capt. D. D. GAILLARD,  
Corps of Engineers, U. S. A.,  
Assistant Engineer Commissioner, District of Columbia.

The projected trunk mains are those referred to in this second report.

This general project has been approved and the following steps taken toward execution:

1. One basin of Brightwood reservoir completed and contract made for second basin.
2. Ten thousand nine hundred linear feet of 36-inch main laid, connecting reservoir with the city.
3. General plans prepared for new pumping station, and architects invited to submit competitive designs therefor. These designs are to be received on August 1.
4. Specifications drawn for two 20,000,000-gallon high-duty pumping engines, contract for same entered into with the Edward P. Allis Company, of Milwaukee. Contract price for both engines, \$148,000.
5. The use of a plot of land belonging to the United States, containing about 10 acres, situated on Trumbull street, just south of the Howard University reservoir granted to the District of Columbia by the Secretary of War as a site for the pumping station. A contract has been entered into for the grading of this site the work is now in progress.
6. Surveys have been made for line of 36-inch pipe needed to connect the pumping station with the trunk main at Thirteenth street and Florida avenue, leading to the Brightwood reservoir.

Following are abstracts of all bids received for work which was advertised during the past year:

### *Proposals for completing Brightwood reservoir, opened May 5, 1900.*

Name of bidder.	Excavation per cubic yard (estimated quantity 35,000).	Concrete, sand, and gravel, and stone per cubic yard (estimated quantity 9,500).	Concrete, sand, and gravel per cubic yard (estimated quantity 9,500).	Copied square (estimated quantity 2,000).
Cranford Paving Co. ....	\$0.33	\$8.95	\$8.25	
Andrew Gleason .....	.35	7.79	7.65	
J. C. Regan & Co. <sup>1</sup> .....	.38	7.25	7.40	
R. A. Malone .....	.38	8.00	7.95	
Brennan Construction Co. ....	.40	8.32	8.05	
C. H. Eslin .....	.33	7.84	7.84	

<sup>1</sup> Contract awarded.

# OPERATIONS OF THE ENGINEER DEPARTMENT, D. C. 31

*Proposals for erecting two gatehouses at Brightwood reservoir, opened May 19, 1900.*

Name of bidder.	Each.
J. F. Manning & Co.....	\$18,998.00
D. F. Mockbee.....	25,915.00

All bids rejected.

*Proposals for furnishing two 36-inch check valves, opened May 26, 1900.*

Name of bidder.	Each.
Frank W. Dilks.....	\$855.00
Eddy Valve Co.....	800.00
Michigan Brass and Iron Works <sup>1</sup> .....	580.00
Rensselaer Manufacturing Co.....	598.00

<sup>1</sup> Contract awarded.

*Proposals for excavating on site for new pumping station, opened June 9, 1900.*

Name of bidder.	Price per cubic yard (estimated quantity 15,000).
M. F. Talty.....	\$0.21
Lyons Bros.....	.23
Geo. S. Post.....	.30
Andrew Gleeson <sup>1</sup> .....	.144

<sup>1</sup> Contract awarded.

*Proposals for furnishing and erecting two 20-million gallon pumping engines, opened June 30, 1900.*

Name of bidder.	On District of Columbia specifications without modifications.	On District of Columbia specifications with direct connected auxiliaries.	On District of Columbia specifications, but with both direct and independent auxiliaries.	Rotary pump driven by vertical triple expansion engine.	Rotary pump driven by vertical quadruple expansion engine 250 pounds steam pressure.	Same as preceding, but including boiler.
The Edw. P. Allis Co., of Milwaukee, Wis.....	\$210,000	<sup>1</sup> \$148,000	\$151,000			
The Camden Iron Works, of Philadelphia, Pa.....	171,000		170,000			
The Holly Manufacturing Co., of Lockport, N. Y.....	216,525	181,790				
The P. H. & F. M. Roots Co., of Connersville, Ind.....	350,000			\$228,000	\$219,000	\$230,000

<sup>1</sup> Contract awarded.

During the next fiscal year it is expected that the Brightwood reservoir will be completed, plans secured for new pumping station and contract made for its erection, contract made for steam plant for station, and for all main pipe work in its immediate vicinity, and surveys made for general extension of trunk mains in accordance with the approved project.

The contract for the new pumping engines requires their completion by December 31, 1902.

The early establishment of a small pumping station in Anacostia will be necessary if satisfactory water pressures are to be secured for that part of the District.

## 32 OPERATIONS OF THE ENGINEER DEPARTMENT, D. C.

A general increase of water pressures on Capitol Hill and over the higher parts of the gravity system in the northwest can not be secured until after the completion of the new Washington Aqueduct extension.

Very respectfully, your obedient servant,

W. A. MCFARLAND,  
Superintendent Water Department.

Capt. LANSING H. BEACH,  
Corps of Engineers, U. S. A.,  
Engineer Commissioner, District of Columbia.  
(Through Captain Gaillard.)

TABLE I.—*Mains laid and miscellaneous work during the fiscal year ending June 30, 1900.*

New mains laid:	linear feet..	10,928
36 inches diameter.....	do.....	5
24 inches diameter.....	do.....	1,222
20 inches diameter.....	do.....	6
16 inches diameter.....	do.....	127
12 inches diameter.....	do.....	68,116
6 inches diameter.....	do.....	4,211
4 inches diameter.....	do.....	2,114
3 inches diameter.....	do.....	17
2 inches diameter.....	do.....	456
1½ inches diameter.....	do.....	722
Six-inch connections to fire hydrants.....	do.....	1,000
Mains lowered.....	do.....	225
New stop valves.....	do.....	8
Fire hydrants erected.....	do.....	2
Fire hydrants moved to new locations.....	do.....	1
Public hydrants erected.....	do.....	4
Fountains erected.....	do.....	4

TABLE II.—*Summary of the distribution system.*

Size of mains.	In service prior to June 30, 1899.	Added during the fiscal year.	Total June 30, 1900.
75 inches diameter.....linear feet..	660	.....	660
48 inches diameter.....do....	30,000	.....	30,000
36 inches diameter.....do....	23,180	10,902	34,082
30 inches diameter.....do....	37,720	.....	37,720
24 inches diameter.....do....	21,510	35	21,545
20 inches diameter.....do....	35,064	1,282	36,346
16 inches diameter.....do....	2,460	48	2,508
12 inches diameter.....do....	192,360	157	192,517
10 inches diameter.....do....	10,255	.....	10,255
Total trunk mains.....do....	.....	.....	365,658
8 inches diameter.....do....	6,005	.....	6,005
6 inches diameter.....do....	1,876,131	<sup>1</sup> 12,938	1,889,069
4 inches diameter.....do....	126,224	<sup>2</sup> 3,471	129,695
3 inches diameter.....do....	58,384	2,116	60,500
2 inches diameter.....do....	4,101	17	4,118
1½ inches diameter.....do....	2,703	458	3,156
Grand total.....do....	1,926,777	31,419	1,958,196
Stop valves.....number..	3,812	225	4,037
Fire hydrants.....do....	1,906	50	1,956
Public hydrants.....do....	836	2	<sup>3</sup> 833
Service connections.....do....	45,057	134	45,191
Horse fountains.....do....	77	4	81

<sup>1</sup>Total length of 6-inch main laid: 53,838 feet minus 40,900 feet abandoned (this includes mains abandoned during preceding fiscal year) on account of electric-railway construction. Net gain 12,938 feet, as above.

<sup>2</sup>Total length of 4-inch main laid: 4,211 feet minus 740 feet; abandoned on account of electric-railway construction. Net gain 3,471 feet, as above.

<sup>3</sup>Five public hydrants abandoned.

TABLE III.—Statement showing cost of water mains laid during the fiscal year ending June 30, 1900.

Location.	Size.	Length.	Cost of material.	Cost of labor.	Total cost.
	<i>Inches.</i>	<i>Lin. feet.</i>			
Alley, square 719 .....	3	83	\$28.37	\$30.28	\$58.65
Alley, square 628 .....	3	181.5	80.92	93.82	174.74
Alley, square 367 .....	3	62.7	21.75	22.40	44.15
Alley, square 197 .....	3	129.4	44.40	112.08	156.48
Alley, square 568 .....	3	178.6	79.91	53.39	133.30
Brightwood Reservoir .....	3	1,148	216.41	188.22	404.63
Center Linden N.E., from Twelfth to Thirteenth .....	4	525	141.91	145.35	287.26
South side U N.W., from Twelfth to Thirteenth .....	4	443.5	135.06	164.70	299.76
Center Sheridan N.W., west of Fourteenth .....	4	398.5	73.97	83.50	157.47
Alley, square 594 .....	4	313.5	150.73	166.88	317.61
Alley, square 1184 .....	4	370.5	178.81	230.22	409.03
Alley, square 51 .....	4	114.5	48.95	64.75	113.70
Alley, square 619 .....	4	167.4	80.74	79.74	152.38
Center Decatur N.E., from North Capitol to First .....	4	542.8	213.01	225.22	438.23
Alley, square 652 .....	4	216.5			
Center Half S.W., south of N .....	6	122.2	135.55	78.57	214.12
South side Baltimore N.W., from Columbia road to Nineteenth .....	6	420.2	253.46	105.38	358.84
West side Twenty-ninth N.W., between Q and U .....	6	59	26.83	21.73	48.56
North and south sides G S.E., from Eighth to Ninth .....	6	1,027.5	452.82	387.50	840.32
North side G, from Ninth to Tenth .....	6	684.1	478.52	114.90	593.42
Center Thirty-seventh N.W., from U to W .....	6				
Center Seventh, Petworth, from Omaha to Philadelphia .....	6	373	172.34	71.10	243.44
Center Quincy, Petworth, from Eighth to Ninth .....	6	446.6	183.23	53.50	236.73
West side North Capitol N.W., north from S .....	6	146.1	109.89	48.29	158.18
Center Bates N.W., from North Capitol to First .....	6	140	73.93	35.55	109.48
North side Maryland avenue N.E., east from Tenth .....	6	160.9	103.21	52.27	155.48
North side C N.E., from Fifth to Sixth .....	6	242.8	137.76	83.31	221.07
East side Tennessee avenue N.E., between C and D .....	6	256.3	138.07	65.63	203.70
Center S N.W., between First and LeDroit avenue .....	6	20	10.48	7.30	17.78
North side East Capitol N.E., from Fifteenth to Sixteenth .....	6	340.6	140.74	99.07	239.81
Nebraska avenue, from Wisconsin avenue to Tunlaw road .....	6	4,098.9	1,773.32	748.29	2,521.61
Center Nineteenth N.W., north of Kalorama avenue .....	6	154	73.98	48.11	122.09
Center Half S.W., north from O .....	6	320	144.00	74.65	218.65
Center Morgan N.W., between Lydecker and Lamar .....	6	256	127.48	69.07	196.55
Center Milwaukee, Cleveland Park, from Wisconsin to Thirty-sixth .....	6	680.4	260.68	145.31	405.99
Center Thirty-sixth, from Milwaukee to Newark .....	6				
Savannah and Harewood road to Holy Cross College .....	6	2,555.7	836.03	614.61	1,450.64
West side New Hampshire, Petworth, from Newark to Eighth .....	6	183.3	113.60	68.64	182.24
Center Seaton N.E., from Lincoln avenue to North Capitol .....	6	560.1	311.95	115.57	427.52
East side North Capitol N.E., from Seaton to T .....	6	196.5	171.91	90.44	262.35
East side Third S.W., south from L .....	6	237.9	132.15	87.33	219.48
South side C S.W., from Seventh to Eighth .....	6	233.7	120.59	68.30	188.89
Center Half S.W., from L to M .....	6	256	123.96	50.60	174.56
Center P N.W., from Thirty-sixth to Thirty-seventh .....	6	365.8	156.63	61.42	218.05
Center Thirty-fourth N.W., from R to S .....	6				
Center Twelfth, Brookland, from Providence to Lansing .....	6	359.5	153.87	94.14	248.01
South side N N.W., east from Seventeenth .....	6	207	95.10	65.11	160.21
Center Fourteenth N.W., north of Howard avenue .....	6	100	59.01	23.79	82.80
West side Nineteenth N.W., from Baltimore to Cincinnati .....	6	389.2	240.78	88.37	329.15
East side Fourteenth S.E., between C and South Carolina avenue .....	6	65	50.73	30.84	81.57
Center Howard, Anacostia, from Nichols avenue to the river .....	6	724.4	293.77	141.87	435.64
Center Seventeenth N.W., from Park to Grant .....	6	708.5	383.09	117.84	500.93
Center Grant, west from Seventeenth .....	6	171.9	98.98	41.33	140.31
South side N N.E., east from North Capitol .....	6	362.7	196.39	116.47	312.86
Center Poplar N.W., from Twenty-seventh to Twenty-eighth .....	6				
South side G S.E., from Ninth to Eleventh .....	6	25,246.9	739.97	513.05	1,253.02
North side G, from Tenth to Eleventh .....	6				
East and west sides Eleventh, from G to K .....	6				
West side Eleventh, from K to the bridge .....	6				
East side Eleventh S.W., from Virginia avenue to Water .....	6	2,909.5	206.21	116.97	323.18
East and west sides Fourth, from New York avenue to M .....	6				
Intersections Fourth and M, Fourth and N .....	6				

<sup>1</sup>883 feet paid for by the Anacostia and Potomac River R. R.<sup>2</sup>3,892 feet paid for by the Anacostia and Potomac River R. R.<sup>3</sup>2,766 feet paid for by the Anacostia and Potomac River R. R.

TABLE III.—Statement showing cost of water mains laid, etc.—Continued.

Location.	Size.	Length.	Cost of material.	Cost of labor.	Total
	<i>Inches.</i>	<i>Lin. feet.</i>			
Center Holmead avenue NW., north from Lamar...	6	173.3	\$112.19	\$48.35	1
South side Virginia avenue SW., from First to Second	6	333.7	173.58	169.68	
West side South Capitol SW., from N to O	6	562.2	250.98	148.45	
East side New Jersey avenue SE., north from L	6	174	122.27	70.20	
South side I SE., Half to First	6	410.8	194.37	81.40	
Center S NW., between First and LeDroit avenue	6	140	59.66	35.08	
North side Canal SE., between South Capitol and E	6	57.6	42.50	22.80	
South side Prospect NW., west from Thirty-seventh	6	124	79.83	45.55	
South side G SE., from Seventh to Eighth	6	340.2	144.66	106.53	
South side K NW., from Twenty-fourth to Twenty-fifth	6	536.6	291.39	188.49	
Center Half SW., from G to I	6	644.3	326.31	159.31	
Center Sixteenth, Argyle, from Argyle Mill road to Brightwood Reservoir	6	917	416.97	243.00	
Center Thirteenth NE., from B to C	6	548.6	256.30	156.92	
Center First NW., north from P	6	99.1	60.04	26.85	
North side Kalorama NW., between Twentieth and Connecticut avenue	6	38.6	17.36	13.00	
Center Twelfth, Brookland, south from Dover	6	131.1	72.06	28.20	
West side Fourth NW., from O to New Jersey avenue	6	12,681.6	1,206.49	697.08	1
East and west sides Fourth, from P to Florida avenue					
East and west sides Harewood avenue, from Florida avenue to Elm					
North and south sides Elm, from Harewood to Linden	6	26,853.9	1,783.57	1,074.88	2
East and west sides Linden, from Elm to Pomeroy					
South side Pomeroy, from Linden to Sixth					
North and south sides Pomeroy, from Sixth to Seventh					
South side I SE., from South Capitol to Half	6	453.7	247.07	106.63	
Center Thomas NW., east from LeDroit	6	407	203.13	99.00	
Center Twenty-fifth NW., south from G	6	161.8	119.91	81.70	
Center A SE., west from Seventeenth	6	124.5	69.06	23.75	
South side Cincinnati NW., west from Nineteenth	6	93	57.59	17.65	
Center S NW., from Thirty-fourth to Thirty-fifth	6	378.4	161.48	75.05	
East side Third SE., from G to Virginia avenue	6	402.1	223.39	123.75	
North and south sides O NW., from Twenty-eighth to Twenty-ninth	6	602.8	350.44	180.98	
East side Brightwood avenue, from Newark to Omaha	6	394.8	219.79	128.85	
Center V NW., east from First	6	597.8	251.88	117.80	
South side Cincinnati NW., east from Nineteenth	6	221.2	132.49	50.60	
Center Twelve-and-a-half NE., north from B	6	200	132.29	47.91	
South side E SE., from Fifth to Sixth	6	302	181.20	101.79	
Center Trenton, Petworth east from Eighth	6	91.1	53.57	19.25	
Center Newport NW., from Twenty-first to Twenty-second	6	582	326.21	184.75	
Center First NW., between P and Bates	6	269.6	157.01	63.02	
Center Bates, east from First					
Center Dartmouth NW., between Sherman avenue and Thirteenth	6	50	20.09	7.35	
Center Woodley, from Wisconsin to Idaho	6	854.4	435.43	167.45	
North side South Carolina avenue SE., from Second to Third	6	645.5	377.92	250.48	
First SE., from North Carolina avenue to E					
North side C SW., between Canal and Delaware avenue	6	18.4	7.11	7.00	
East side Tenth SE., south from G	6	206.7	99.00	87.02	
North side East Capitol NE., east from Sixteenth	6	494.5	272.06	134.82	
Center Sixteenth, from East Capitol to A	6	147.4	99.28	32.70	
Center Seaton NW., east from LeDroit avenue					
North side Pennsylvania avenue SE., from Third to Fourth	6	1,219.3	596.71	509.81	1
North side Pennsylvania avenue, from Sixth to Seventh					
East side Eighteenth NW., south from Willard	6	110.3	129.21	27.63	
Brightwood Reservoir	20	596	2,106.51	1,514.42	3
South side Kenyon NW., from Thirteenth to Fourteenth					
East side Fourteenth, from Kenyon to Piney Branch road					
Piney Branch road, from Fourteenth to Seventeenth					
West side Seventeenth, Argyle, from Piney Branch road to Colorado avenue	36	10,902	52,216.60	17,954.61	70
North side Colorado avenue, from Seventeenth to Sixteenth					
West side Sixteenth, from Colorado avenue to the reservoir					

<sup>1</sup>1,462 feet paid for by the Anacostia and Potomac River R. R.<sup>2</sup>3,868 feet paid for by the Anacostia and Potomac River R. R.

TABLE III.—Statement showing cost of water mains laid, etc.—Continued.

Location.	Size.	Length.	Cost of material.	Cost of labor.	Total cost.
	<i>Inches.</i>	<i>Lin. feet.</i>			
Connections and appurtenances .....			\$2,459.26	\$646.18	\$3,105.44
Unfinished mains June 30, 1899 .....				794.16	794.16
Unfinished mains June 30, 1900 .....				486.04	486.04
Lowering mains .....				625.46	625.46
<b>Total</b> .....			<b>78,084.07</b>	<b>34,460.35</b>	<b>112,544.42</b>
Cost of laying mains, connections, etc., including repairs to improved pavements .....			78,084.07	34,460.35	112,544.42
Cost of erecting fire hydrants, including repairs to improved pavements .....			3,370.20	674.52	4,044.72
Cost of superintendence .....				1,741.30	1,741.30
<b>Grand total</b> .....			<b>81,454.27</b>	<b>36,876.17</b>	<b>118,330.44</b>

TABLE IV.—Statement of the lengths and costs of water mains laid from July 1, 1878, to June 30, 1900.

Fiscal year.	36-inch.	24-inch.	20-inch.	16-inch.	12-inch.	10-inch.	8-inch.
	<i>Lin. feet.</i>	<i>Lin. feet.</i>	<i>Lin. feet.</i>	<i>Lin. feet.</i>	<i>Lin. feet.</i>	<i>Lin. feet.</i>	<i>Lin. feet.</i>
1878.....	40				3,719		
1879.....					7,409		
1880.....							
1881.....							
1882.....							
1883.....					1,625		26
1884.....					1,038		
1885.....					963		
1886.....					1,938	791	
1887.....			4,835		1,124	2,998	
1888.....					731		
1889.....		2,312	5,140		5,626	2,784	
1890.....							
1891.....					5,201		
1892.....			2,926	2,500	10,163		
1893.....					6,473		
1894.....			278		39,386		
1895.....		6,617			27,731		
1896.....		294	8,874		11,873		
1897.....			2,180		6,877		
1898.....					7,698		907
1899.....			1,914		2,220		
1900.....	10,902	35	1,282	48	157		
<b>Total</b> .....	<b>10,942</b>	<b>9,258</b>	<b>27,429</b>	<b>2,548</b>	<b>141,952</b>	<b>6,573</b>	<b>933</b>

Fiscal year.	6-inch.	4-inch.	3-inch.	2-inch.	1½-inch.	Total.	Cost.
	<i>Lin. feet.</i>	<i>Lin. feet.</i>	<i>Lin. feet.</i>	<i>Lin. feet.</i>	<i>Lin. feet.</i>	<i>Lin. feet.</i>	
1878.....	12,781	30				16,570	\$14,846.20
1879.....	8,516	1,397				17,322	19,436.03
1880.....	3,024					3,024	
1881.....	3,709					3,709	3,110.70
1882.....	1,920					1,920	1,626.43
1883.....	4,084					5,735	8,073.70
1884.....	8,972					10,010	10,492.51
1885.....	27,766	358	485			29,572	25,865.35
1886.....	35,192		6,623			44,544	40,025.10
1887.....	30,041	292	7,124			46,414	56,951.00
1888.....	9,123	9,148	3,937			22,939	17,626.63
1889.....	36,742	6,571	8,753			67,928	79,342.16
1890.....	34,737	2,856	2,855			40,448	19,113.54
1891.....	56,893	3,142	11,013			76,249	49,702.65
1892.....	88,709	3,342	1,286			108,926	74,733.04
1893.....	54,173	8,336	3,458			72,440	56,339.39
1894.....	86,632	12,832	2,918			142,046	126,599.55
1895.....	103,785	5,442	2,733			146,308	134,502.31
1896.....	61,464	1,738	3,262			87,505	89,395.12
1897.....	71,266	10,595	992		2,104	94,014	77,954.81
1898.....	52,371	6,735	2,790	1,633	500	72,634	48,661.70
1899.....	84,291	4,662	2,701	79	133	96,000	65,774.52
1900.....	53,838	4,211	2,116	17	453	73,059	114,784.72
<b>Total</b> .....	<b>930,029</b>	<b>81,687</b>	<b>63,046</b>	<b>1,729</b>	<b>3,190</b>	<b>1,279,316</b>	<b>1,134,957.16</b>

NOTE.—In the following years pipe specified was laid under permit system and for connections to fire hydrants, cost not included in above table: 1887, 1,074 feet of 12-inch—1890–1892, 45,246 feet of all

# 36 OPERATIONS OF THE ENGINEER DEPARTMENT, D. C.

sizes; 1893, 434 feet of 3-inch, 4-inch, and 6-inch, and 1,939 feet of 6-inch for fire hydrants; 1895, 14,730 feet of 3 and 6 inch, and 3,406 feet of 6-inch for fire hydrants; 1896, 18,200 feet of 3, 4, and 6 inch and 1,004 feet of 6-inch for fire hydrants; 1897, 1,837 feet of 6-inch and 3,656 feet of 4-inch and 696 feet of 6-inch for fire hydrants; 1898, 907 feet of 8-inch, 3,480 feet of 6-inch, 389 feet of 4-inch, 107 feet of 3-inch, and 146 feet of 1½-inch, and 1,305 feet of 6-inch for fire hydrants; 1899, 33,619 feet of 6-inch, 10 feet of 4-inch, 81 feet of 3-inch, and 452 feet of 6-inch for fire hydrants; 1900, 30 feet of 12-inch, 2,277 feet of 6-inch, 1,066 feet of 4-inch, 332 feet of 3-inch, 17 feet of 2-inch, 453 feet of 1½-inch, and 722 feet of 6-inch for fire hydrants.

TABLE V.—Average cost per foot of laying mains of various sizes, excluding repairs to improved pavements during the fiscal year ending June 30, 1900.

Size.	Linear feet.	Cost of material.	Cost of labor.	Cost of superintendence.	Total cost.
3 inches diameter .....	1,784	\$0.2352	\$0.2041	\$0.0100	\$0.4493
4 inches diameter .....	2,878	.2556	.2420	.0119	.5095
6 inches diameter .....	37,178	.5053	.2586	.0127	.7766
20 inches diameter .....	1,233	3.1878	1.5428	.0756	4.8082
36 inches diameter .....	10,902	4.7663	1.6251	.0796	6.4710

TABLE VI.—Average cost per square yard of relaying improved pavements during the fiscal year ending June 30, 1900.

Cobble .....	\$0.39
Brick .....	.29
Vitrified brick .....	1.00
Belgian .....	1.15
Asphalt block .....	1.15
Sheet asphalt .....	2.00

TABLE VII.—Statement of the lengths and cost of water mains laid under the appropriation for the extension of the high-service system of water distribution from July 1, 1893.

Size of main.	Laid to June 30, 1899.	Added during the fiscal year.	Total laid to June 30, 1900.
	Lin. feet.	Lin. feet.	Lin. feet.
1½-inch .....	2,717		2,717
2-inch .....	1,095		1,095
3-inch .....	660	1,148	1,808
4-inch .....	4,324	398	4,722
6-inch .....	127,285	17,008	144,293
12-inch .....	81,545	127	81,672
16-inch .....		48	48
20-inch .....	13,247	1,282	14,529
24-inch .....	6,911	35	6,946
36-inch .....		10,902	10,902
Total .....	237,784	30,948	268,732

Total cost to June 30, 1899.....\$281,085.99  
Cost for fiscal year ending June 30, 1900.....88,881.44

Total cost to June 30, 1900.....369,967.44

TABLE VIII.—Average daily consumption, middle and high services.

Month.	Middle service.	High service.	Month.	Middle service.	High service.
1899.	Gallons.	Gallons.	1900	Gallons.	Gallons.
July .....	5,679,000	201,550	January .....	6,972,800	172,610
August .....	5,635,860	150,660	February .....	8,032,500	236,590
September .....	5,963,560	183,670	March .....	7,458,360	215,890
October .....	6,468,300	156,910	April .....	7,947,670	205,500
November .....	5,732,100	161,300	May .....	6,873,000	264,450
December .....	6,343,900	225,390	June .....	6,893,960	215,144

TABLE IX.—*Statement of the number of shallow and deep wells.*

	Shallow wells.	Deep wells.	Total.
In service June 30, 1899.....	82	39	121
Sunk and equipped for use during fiscal year ending June 30, 1900.....		3	3
	82	42	124
Closed and discontinued during the fiscal year ending June 30, 1900.....	15	2	17
In service June 30, 1900.....	67	40	107

## REPORT OF THE WATER REGISTRAR.

WASHINGTON, D. C., *July 31, 1900.*

CAPTAIN: I have the honor to submit the following report of the operations of the revenue and inspection division of the water department for the year ending June 30, 1900:

Inspections made.....	108,364
Number of premises in which leaks were found.....	11,452
Number of water bills delivered by inspectors.....	34,049
Certificates of water taxes issued.....	6,187
Water-main assessment notices served.....	966
Taps issued.....	1,276
Stop cocks issued.....	726
Permits for water examined.....	2,486

With the steady increase in the number of buildings, the introduction of water into houses heretofore unsupplied, the installation of water meters, the large territory to be covered in the inspection for leaks and wastes, in the delivery of water-rent bills and water-main assessment notices—the requirements of the law making the personal service of the latter obligatory, where possible—the amount of work devolving upon the inspection branch of this office has become so great that the present corps of inspectors is found inadequate for the performance of all assigned duties, while the clerical force, consisting of only four, one of whom is detailed exclusively to water-main tax business, has long since been found insufficient to cope with the demands made upon it, and, in consequence, inspectors are detailed to do clerical work, thus curtailing a force already too small to satisfactorily cover a constantly growing area. It is for this reason that I submit in my estimates an addition of two inspectors at \$900 each per annum, and two clerks at \$1,200 each per annum. With this addition the necessity of detailing inspectors for office work would be eliminated, while the efficiency of the department would be greatly increased.

An addition of \$200 in the salary of one of the \$1,400 clerks is submitted. It is earnestly hoped that your influence will be used in securing this increase. The employee for whom this advance is sought performs duties of much responsibility, and in my absence is detailed to act as chief clerk. This augmentation, if granted, will be a just reward for faithful and conscientious services rendered.

Your attention is invited to the extremely crude method in which water-main tax accounts are kept, the prevailing system having been in vogue since the inception of this branch of the business. It is only necessary to state that frequently an account must be traced through half a dozen books before desired information can be found, and that with each new subdivision the records become more complicated, to show how much time and energy are wasted, and the urgent necessity for changing this antiquated, error-producing system, into an up-to-date card system. I have therefore asked an appropriation of \$2,500, to be immediately available, for necessary material and labor in this work of transformation, which will simplify the present methods, give greater satisfaction to the public, and insure accuracy.

Five tables are herewith submitted.

Very respectfully,

GEO. F. GREEN,  
Water Registrar, District of Columbia.

Capt. LANSING H. BEACH,  
Corps of Engineers, U. S. A.,  
Engineer Commissioner, District of Columbia.  
(Through Captain Gaillard.)

# 38 OPERATIONS OF THE ENGINEER DEPARTMENT, D. C.

TABLE I.—Financial statement from July 1, 1899, to June 30, 1900.

<b>Revenues:</b>			
Balance to the credit of the water fund July 1, 1899.....			\$326,575.66
Schedule water rents.....	\$238,592.87		
Meter water rents.....	47,664.76		
		286,257.63	
Current water-main tax.....	27,928.19		
Advertised water-main tax.....	19,290.19		
	47,218.38		
Less abatements, at 6 per cent.....	586.85		
		46,631.53	
Interest on current water tax.....	1,944.83		
Interest on advertised water tax.....	4,844.34		
		6,789.17	
Water taps and stopcocks.....		5,208.15	
Permits and miscellaneous.....		4,452.53	
			\$675,1
<b>Expenditures:</b>			
Salaries.....	30,016.00		
Contingent expenses.....	2,253.77		
Refunded water rents.....	1,474.22		
Pumping expense and pipe distribution.....	120,139.38		
High service.....	268,815.45		
Interest on water bonds.....	6,022.00		
		428,720.77	
Less repayments.....		37,741.21	
			390,1
Balance to credit of water fund July 1, 1900.....			284,1

TABLE II.—Comparative statement of revenues.

Fiscal year.	Water rents.	Water-main assessments.	Taps and stopcocks.	Permits, etc.	Total nu
1890.....	\$197,053.34	\$45,386.55	\$5,313.72	\$6,327.95	\$254,1
1891.....	209,664.29	50,332.93	5,640.00	6,869.79	272,1
1892.....	220,892.93	68,807.35	5,790.00	6,280.81	301,1
1893.....	235,911.25	70,026.33	7,307.09	7,931.71	221,1
1894.....	245,899.69	86,975.44	4,497.00	1,168.79	338,1
1895.....	251,872.71	72,972.24	4,537.55	2,100.60	331,1
1896.....	255,439.11	27,666.57	4,026.00	1,191.09	288,1
1897.....	253,500.16	53,653.39	5,157.00	1,128.28	313,1
1898.....	264,784.48	58,152.56	6,910.65	1,104.42	330,1
1899.....	276,065.54	62,937.43	6,327.00	1,545.15	346,1
1900.....	286,257.63	53,420.70	5,208.15	4,452.53	349,1
1901 <sup>1</sup> .....	290,000.00	60,000.00	7,000.00	1,200.00	358,1
1902 <sup>1</sup> .....	295,000.00	60,000.00	8,500.00	2,000.00	365,1

<sup>1</sup> Estimated.

TABLE III.—Statement of assessments and collections of water-main taxes from July 1, to June 30, 1900.

Fiscal year.	Amount of water-main tax assessed.	Duplicate and overpay-ments.	6 per cent abatement.	Amount of water-main tax canceled.	Amount of water-main tax collected.	Amot collected water tax stand
From July 1, 1878, to June 30, 1899.....	<sup>1</sup> \$1,220,785.49	\$2,104.45	\$28,259.07	\$206,190.54	\$825,620.67	\$162,1
1900.....	38,237.97		586.85	<sup>2</sup> 12,554.26	53,989.55	<sup>3</sup> 28,1
Total.....	1,259,023.46	2,104.45	28,845.92	218,744.80	879,610.22	133,1

<sup>1</sup> Of this amount \$94,124.78 was outstanding and uncollected July 1, 1878.

<sup>2</sup> \$12,189.87 of this amount was canceled under act of June 2, 1900, and can be reassessed.

<sup>3</sup> This amount is the excess of the amounts collected, canceled, and abated over the tax levie

## RECAPITULATION.

Amount of assessments and duplicate payments.....	\$1,261,1
Amount of abatement, at 6 per cent.....	28,1
Amount of water-main tax canceled since July 1, 1878.....	218,1
Amount of water-main tax collected from July 1, 1878, to June 30, 1900.....	879,1
Amount of water-main tax outstanding July 1, 1900.....	133,1
	1,261,1

# OPERATIONS OF THE ENGINEER DEPARTMENT, D. C. 39

TABLE IV.—Premises in the District of Columbia supplied with Potomac water.

Number of dwellings—	North-west.	North-east.	South-west.	South-east.	Total.
Oct. 1899.....	25,671	4,852	7,617	5,970	44,110
ending June 30, 1900.....	627	198	144	125	1,094
Total.....	26,298	5,050	7,761	6,095	45,204

## MISCELLANEOUS WATER TAKERS.

	North-west.	North-east.	South-west.	South-east.	Total.
.....	5				5
ops.....	105	31	19	19	174
.....	21	6	5	9	41
.....	1		1	1	3
houses.....	226	79	15	32	352
.....	260	13	16	17	306
ses.....	4				4
leposts.....	1		1		2
.....	42	14	9	10	75
ns.....	8		1	1	10
engines.....	2				2
oms.....	64	7	1	3	75
es.....	3				3
ouses.....	15	2	3		20
.....	10	1	2	2	15
.....	6		1		7
es.....	3				3
ent reservations.....	32	6	3	5	46
ses.....	10				10
.....	17	5	1	3	26
.....	6			1	7
.....	80	16	17	21	134
.....	188	10	20	16	229
tions.....	6	1	1	1	9
sh galleries.....	12				12
.....	689	114	170	102	1,075
.....	180	9	19	15	213
ines.....	6				6
.....	1,463	336	222	251	2,272
ools.....	51	10	14	14	89
hools.....	14	1	1	1	17
is.....	4				4
re department.....	3	1			4
es.....	26	6	6	1	39
coal yards.....	6	1		1	8
Total.....	3,464	669	548	526	5,207

## SUMMARY, BY LOCATION, OF MISCELLANEOUS WATER TAKERS.

Location.	Houses supplied with Potomac water.		Miscellaneous water takers.	
	Number.	Percent.	Number.	Percent.
West section.....	26,298	58.17	3,464	66.52
East section.....	5,050	11.17	669	12.86
Southwest section.....	7,761	13.49	548	10.52
Southeast section.....	6,095	17.17	526	10.10
Total.....	45,204		5,207	

## 40 OPERATIONS OF THE ENGINEER DEPARTMENT, D. C.

TABLE V.—*Water meters.*

	½-in.	¾-in.	1-in.	1½-in.	2-in.	3-in.	4-in.	6-in.	Register.	Total.
Worthington .....			3	13	14	23	16	4		73
Thomson .....	4	3	104	92	58	29	5	3	1	299
Crown .....	1		7	24	30	18	11	1	4	96
Nash .....	6	2	129	174	97	50	11	7	2	473
Union .....		1	36	45	11	10	1	1		105
Niagara .....				3	1	1				5
Lambert .....			23	3	1	3		1		31
Gem .....						3	5	1	1	10
Hersey disk .....		1	1	1	4	4				11
Davies disk .....					2					2
Trident .....					1	6	12			20
Pittsburg disk .....		1								5
Registers .....									5	5
Total .....	11	8	303	355	219	147	61	18	5	1,130

## REPORT OF THE SUPERINTENDENT OF SEWERS.

WASHINGTON, July 17, 1900.

CAPTAIN: I have the honor to submit the following report of the operations of the sewer division for the fiscal year 1899-1900:

*Cleaning and repairing sewers and basins:*

Cleaned:	
Pipe sewers .....	feet.. 124,850
Main sewers .....	do.. 9,699
Manholes .....	8,259
Catch-basins .....	100,067
Street detritus and sludge removed .....	cubic yards.. 10,421
Repairs:	
Pipe sewers constructed .....	feet.. 519
Pipe sewers taken up and relaid .....	do.. 1,287
Main sewers repaired .....	do.. 976
Basins constructed .....	16
Basins reconstructed .....	43
Basins repaired .....	186
Basin tops replaced .....	47
Basin covers (cast iron) replaced .....	94
Basins abandoned .....	10
Outlets cleaned .....	116
Manholes constructed .....	13
Manholes reconstructed .....	23
Manholes adjusted to grade .....	101
Manholes repaired .....	360
New frames and covers replaced .....	92
Manhole covers replaced .....	119
Alley basins constructed .....	2
Alley grates and frames replaced .....	28
Total number of minor repairs .....	670
Total number of jobs .....	1,428

The Tiber sewer flushing gates were operated through the year. Two gangs were employed cleaning catch-basins and two gangs were employed in flushing sewers:

Amount expended for cleaning catch-basins .....	\$12,228.62
Amount expended for manual flushing .....	4,242.63

Wrought iron "sanitary" wagons were purchased and placed in service with the basin-cleaning gangs, and the wooden carts formerly hired were dispensed with.

A contract was entered into with Andrew Gleeson to reconstruct 600 feet of the invert of the North Capitol street sewer, and work thereon was begun in the latter part of June.

#### REPLACING OBSTRUCTED SEWERS.

There were constructed, by day labor, 9,528 linear feet of pipe sewers, varying from 8 to 24 inches in diameter; 1,233 linear feet of 6-inch lateral connections, and 59 manholes. One hundred and seventy-seven house connections were made.

The appropriation for the current year will provide for the practical completion of the work of replacing the obstructed sewers which were constructed prior to the adoption of the present methods. Any work of this character required in the future will be small in amount and may be performed as minor repairs. No appropriation for the year 1902 is requested.

#### MAIN AND PIPE SEWERS.

Main sewers were constructed, under contract, in O and P streets NW., between Thirty-fifth and Thirty-sixth streets; in Pennsylvania avenue NW., between Fifteenth street and Madison place; and in First street NE., between D and F streets; also 5,320.15 linear feet of pipe sewers, varying from 12 to 24 inches in diameter. By day labor there were constructed 14,046.22 linear feet of sewers, varying in size from 6 inches to 2.25 by 3.375 feet diameter, 86 manholes, and 106 receiving basins; divided among 128 jobs, the average length per job being 109.66 linear feet, and the average cost per job, \$249.20.

#### SUBURBAN SEWERS.

Main sewers were constructed, under contract, in Quincy street, between Brightwood avenue and Seventh street; in Trinidad street, across land of W. S. Clark; in Ontario avenue, between Zoological Park and Lanier avenue; in Thirty-seventh street NW., between W and Y streets, and Y street, between Thirty-seventh and Thirty-eighth streets; also 4,585.3 linear feet of pipe sewers, varying in size from 12 to 24 inches in diameter. By day labor there were constructed 5,712 linear feet of pipe sewers, varying in size from 8 to 24 inches in diameter, and 34 manholes, divided among 25 jobs. The average length per job was 228.48 linear feet, and average cost per job, \$429.61.

#### ASSESSMENT AND PERMIT WORK.

*Permit work.*—There were constructed 6,794 linear feet of pipe sewers, varying in size from 8 to 18 inches in diameter, divided among 43 jobs, averaging in cost per job \$22.07, in length of sewer per job 158 linear feet, and in cost per linear foot, \$1.469—.

*Assessment system.*—There were constructed 13,344.5 linear feet of pipe sewers, varying in size from 8 to 12 inches in diameter, divided among 61 jobs, averaging in cost per job, \$344.99; in length of sewer per job, 218.6 linear feet, and in cost per linear foot, \$1.58—.

*Whole cost work.*—100.19 linear feet, 4.5 feet diameter brick sewer, and 30 linear feet of 12 inches diameter pipe sewer were reconstructed at intersection of Fourteenth and D streets NW. 6 linear feet 8-inch, 35 linear feet 18-inch, and 168 linear feet 21-inch diameter sewers were constructed in G street NW., between North Capitol and First streets, and 7 manholes, 6 basins, and connections were constructed.

#### AUTOMATIC FLUSHING TANKS.

Five flushing basins in various localities were constructed from the appropriation for automatic flushing tanks.

#### TIBER CREEK AND NEW JERSEY AVENUE HIGH-LEVEL INTERCEPTING SEWER.

Work under contract 2446 with J. K. Murphy is in progress, and 1,299 feet of sewer has been completed. Considerable difficulty was experienced in supporting the sides of the excavation at and adjacent to the crossing of B street. Traffic on the electric road was not interrupted, however.

Work under contract 2632 with T. B. Jones & Co. was completed. One thousand eight hundred and forty-six feet of sewer was constructed. Several houses on the

east side of Arthur place settled badly, although the trench was well braced and every precaution taken to prevent settlement.

The connection with Tiber sewer was not made; this can not be done prior to the completion of the outlet section.

#### EXTENSION OF BOUNDARY SEWER.

No work was performed. Bids for its construction were received, but the lowest amount bid exceeded the limit placed by Congress, viz, \$190,000.

#### EAST SIDE INTERCEPTING SEWER.

Under contract 2743 with John Jacoby 1,555 feet of this sewer has been constructed, and work is still in progress.

Upon the subject of the construction of service sewers, I respectfully reiterate my recommendation contained in the annual report for the fiscal year 1898: "I respectfully invite attention to an absence of equity in the construction of service sewers. In consideration of the fact that the larger sewers are larger and more expensive because they are required to serve as outlets for smaller sewers, it has seemed unfair that they should be charged against the abutting property, and the practice of the office is to construct sewers of greater size than 12 inches in diameter from the appropriation for main and pipe sewers or the appropriation for suburban sewers. Sewers 12 inches and under in diameter are usually constructed under the assessment system, in which case one-half of the cost is taxed against the abutting property. According to this practice property abutting upon sewers above 12 inches in diameter is not taxed on account of the sewer construction, although it receives as much benefit as property which is taxed for the construction of sewers under the assessment system. Again, under the assessment system the owner of the corner lot is, in many instances, compelled to pay as much as five times the amount assessed against the adjacent lot of equal area, each receiving equal benefit. In my opinion all properties abutting upon a service sewer should pay a proportion of its cost, and assuming the average cost of 12-inch sewers as a foundation, \$7.50 for each 1,000 feet of lot area would place the charge upon a fair basis."

I would respectfully suggest that it would be a great help to the work of the office if the construction appropriations were so made that they would be available until expended instead of lapsing with the fiscal year. There is no apparent advantage in the present arrangement, and many disadvantages. I also suggest that an effort be made to raise the limit of expenditure permissible by day labor from \$1,000 to \$3,000. This is especially desirable for emergency and repair work.

#### PLANS FOR PUMPING STATION.

Studies of the drainage conditions were made, and it was decided that provision for pumping 930 cubic feet per second should be made; also that a separate line for deep drainage of the "low district" should be constructed. Studies upon the subject of installation were made which led to the adoption of pumps of the centrifugal type revolving on a vertical axis, each driven by a horizontal engine, the sewage pumps to be driven by a compound engine, the storm-water pumps to be actuated by simple engines.

Borings of the pumping-station site and soundings of the river adjacent thereto have been made, and a general design for the station has been submitted.

The aggregated length of sewers constructed during the year was: Main sewers, 13,969.24 linear feet (2.65 miles); pipe sewers, 51,966.85 linear feet (9.84 miles).

Total length of sewers in the District of Columbia: Main sewers, 88.30 miles; pipe sewers, 317.20 miles.

Tables numbered from 1 to 10 are transmitted herewith.

Table No. 1 shows work performed under contract.

Table No. 2 shows work performed under the permit system.

Table No. 3 shows work performed under the assessment system.

Table No. 4 shows work performed at whole cost to the applicant.

Table No. 5 shows work performed by day labor chargeable to the appropriation for replacing obstructed sewers.

Table No. 6 shows work performed by day labor chargeable to the appropriation for main and pipe sewers.

Table No. 7 shows work performed by day labor chargeable to the appropriation for suburban sewers.

Table No. 8 shows work performed by day labor chargeable to various appropriations (of other departments) and the appropriation for automatic flushing tanks.

Table No. 9 shows average cost per foot of sewers constructed by day labor.

Table No. 10 shows number of inspectors, foremen, and other employees of the sewer division, office of the inspector of asphalt and cements, and the engineer stables temporarily required, and the appropriation from which paid for the year ending June 30, 1900.

Very respectfully, your obedient servant,

D. E. McCOMB,  
*Superintendent of Sewers.*

Capt. LANSING H. BEACH,  
*Corps of Engineers, U. S. A.,*  
*Engineer Commissioner, District of Columbia.*  
(Through Captain Gaillard.)

# 44 OPERATIONS OF THE ENGINEER DEPARTMENT, D. C.

TABLE 1.—Statement of sewers constructed under contract

Number of contract.	Contractor.	Location.	Size of sewer.	Length of sewer.	Cost per foot.
2634	T. M. Leshner & Son...	O and P streets NW., between Thirty-fifth and Thirty-sixth streets.	2.75 by 4.125, brick.	575.25	...
2680	Adam McCandlish	Sixth street NW., between K street and New York avenue; K street NW., between Sixth and Seventh streets; New York avenue NW., between Sixth and Seventh streets; Seventh street NW., between K street and New York avenue.	24-inch pipe ..... 21-inch pipe ..... 18-inch pipe ..... 15-inch pipe ..... 12-inch pipe .....	154.25 265.10 524.20 434.05 232.50	80
		New York avenue NW., between Fourth and Fifth streets.	21-inch pipe ..... 18-inch pipe ..... 15-inch pipe .....	198.1 299.9 83	
		Pennsylvania avenue, Fifteenth street, and Madison place; Madison place, Pennsylvania avenue, and alley, and in square 221.	2.25 by 3.375, brick. 18-inch pipe .....	367.22 199.75	...
		D street SE., between Twelfth and Fifteenth streets.	21-inch pipe ..... 18-inch pipe .....	47.3 514.1	
		New Jersey avenue SE., between C and D streets.	18-inch pipe .....	378.8	
		C street NW., between Twelfth and Thirteenth streets.	21-inch pipe ..... 18-inch pipe .....	25.6 198	
		Thirteenth street NW., between C and D streets.	12-inch pipe ..... 10-inch pipe .....	135.7 135.5	
		Twelfth street NW., between C and D streets.	18-inch pipe ..... 12-inch pipe .....	31.6 257.9	
2742	E. G. Gummel.....	Thirty-fifth street, between Madison street and Georgetown and Rockville road.	12-inch pipe .....	529.9	
2744	Adam McCandlish..	Thirty-fifth street, between Q and T streets.	24-inch pipe ..... 21-inch pipe .....	671.9 3	
		First street NE., between D and F streets.	2.75 by 4.125, brick. 2 by 3, brick .....	449.5 61	...
2713	Andrew Gleason....	Quincy street, between Brightwood avenue and Seventh street.	3.5 diameter, brick	986.15	...
		Trinidad street, across land of W. S. Clark.	3.25 by 4.875, brick. 18-inch pipe ..... 15-inch pipe .....	318 36 150.7	...
		Intercepting sewer in Zoological Park.	12-inch pipe ..... 10-inch pipe .....	476.9 248	
		Kansas avenue, between Ontario avenue and Adams Mill road.	24-inch pipe ..... 21-inch pipe .....	400.8 408.8	
		Lanier avenue, between Adams Mill road and Ontario avenue.	12-inch pipe ..... 15-inch pipe .....	34 416.7	
		Adams Mill road, between Kansas and Lanier avenues.	18-inch pipe .....	329.4	
		Ontario avenue, between Zoological Park and Lanier avenue.	2.25 by 3.375, brick. 18-inch pipe ..... 15-inch pipe .....	740.8 323 180.1	...
2744	Adam McCandlish..	Eighteenth street NW., between Kenesaw and Grant streets, and in Grant street between Seventeenth and Eighteenth streets.	24-inch pipe ..... 21-inch pipe ..... 18-inch pipe .....	641.7 341.8 546.4	
2746	W. F. Brenizer .....	Thirty-seventh street NW., between W and Y streets, and in Y street between Thirty-seventh and Thirty-eighth streets.	3.25 by 4.875, brick. 3 by 4.5, brick..... Bell-section, brick 2 by 3 feet, brick..	458.1 446.05 11.8 3.1	...
2743	John Jacoby.....	East side interceptor, between New Jersey avenue and Twelfth street.	18-inch pipe ..... 6.25 feet, brick....	51 1,555	...
2446	J. K. Murphy .....	Tiber Creek and New Jersey avenue high-level intercepting sewer.	14 feet by 14 feet 3 inches, D-shape.	5,209	...
2632	T. B. Jones & Co ....	North portion Tiber Creek and New Jersey avenue high-level intercepting sewer.	14 feet by 14 feet 3 inches, D-shape. 9 feet by 11 feet, D-shape.	2,120.7 335.3	...

<sup>1</sup> Includes \$16.25 cost of work by plumber; \$3 of this amount was charged to the contractor.

<sup>2</sup> Includes \$157.35 for repairs to pavements outside of lines of sewer trench, charged to contractor, and \$2.56 cost of repairs to water main, charged to contractor.

chargeable to appropriations for fiscal years 1899 and 1900.

Allowance to contractor.	Material furnished.		Cost of inspection.	Cost of repairs to pavements.	Total cost.	Appropriation.
	Chargeable.	Not chargeable.				
\$2,938.06	\$640.39	\$14.28	\$112.00	<sup>1</sup> \$186.83	\$3,891.56	Main and pipe sewers, 1899.
2,590.63	175.50	677.41	182.00	449.23	4,074.77	Do.
781.44	50.25	254.22	48.00	135.92	1,269.83	Do.
1,733.30	384.90	85.21	119.00	<sup>2</sup> 625.38	2,947.79	Do.
776.72	59.00	221.24	52.00	18.90	1,127.86	Do.
496.27	40.72	138.94	38.00	55.97	768.90	Do.
305.62	22.00	105.51	24.00	74.61	531.74	Do.
284.34	21.00	58.41	16.00	75.10	454.85	Do.
301.39	30.75	71.68	36.00	79.61	519.43	Do.
498.76	48.50	100.21	88.00	107.21	842.68	Main and pipe sewers, 1900.
1,126.82	85.47	446.10	92.00	.....	1,750.39	Do.
<sup>3</sup> 1,842.98	.....	.....	236.00	.....	2,078.98	Do.
5,383.66	827.51	6.02	221.50	.....	6,438.69	Suburban sewers, 1900.
1,353.45	383.46	12.24	80.00	.....	1,829.15	Do.
1,285.04	56.25	176.25	98.00	.....	1,615.54	Do.
1,306.67	105.00	517.18	94.00	.....	2,022.85	Do.
576.53	27.00	109.90	20.00	.....	733.43	Do.
674.02	40.50	115.46	82.00	.....	911.98	Do.
3,864.69	786.73	184.14	274.00	.....	5,109.56	Do.
2,125.32	180.64	832.07	250.00	.....	3,388.03	Do.
3,606.87	1,116.37	27.74	180.00	.....	4,930.98	Do.
<sup>3</sup> 12,723.60	.....	.....	834.00	.....	13,557.60	East side interceptor, between Twelfth street and pumping station, 1900.
<sup>4</sup> 181,885.90	.....	.....	6,593.62	.....	<sup>4</sup> 188,479.52	Tiber Creek and New Jersey avenue high-level intercepting sewer.
<sup>5</sup> 92,120.91	.....	.....	2,479.00	.....	<sup>45</sup> 94,599.91	North portion Tiber Creek and New Jersey avenue high-level intercepting sewer.

<sup>3</sup> Work incomplete; payment made on account.

<sup>4</sup> Includes work previously reported upon.

<sup>5</sup> Final voucher not made out.

TABLE 2.—Statement of sewers laid under the appropriation for assessment  
VOLUNTARY

No. of order.	Location.	Pipe sewer laid (length in feet).					Man-holes.	Branches.
		8-inch.	10-inch.	12-inch.	15-inch.	18-inch.		
32	Adams Mill road, between Columbia road and Lanier avenue.	.....	.....	230	.....	.....	1	7
5	B street SE., between Eighth and Ninth streets.	.....	.....	112	.....	.....	1	2
27	do.	.....	11	.....	.....	.....	1	1
36	Bunker Hill road, west of Seventh street NE.	.....	67	.....	.....	.....	1	2
23	Canal street SW., between Delaware avenue and South Capitol street.	.....	.....	99	.....	.....	1	6
34	Cincinnati street NW., between Rock Creek and Adams Mill road.	.....	.....	420	.....	.....	2	.....
37	do.	.....	422	.....	.....	.....	2	25
35	Dartmouth street NW., between Thirteenth street and Sherman avenue.	.....	.....	.....	.....	34	.....	1
25	E street SE., between New Jersey avenue and Canal street and Canal and South Capitol sts.	.....	76	61	6	.....	1	7
26	Eighteenth street NW., between Ingleside terrace and Lowell street.	.....	104	.....	318	.....	1	4
43	Eighteenth st. NW., between T and Willard sts.	.....	80	54	.....	.....	1	4
2	Square 503.	.....	14	.....	.....	.....	.....	1
8	Fourth street SE., between D street and North Carolina avenue.	.....	31	.....	.....	.....	.....	2
14	First street NW., between W and Albany streets.	.....	.....	.....	355	.....	2	5
17	Florida ave. NE., between Twelfth and Trinidad.	.....	.....	14	.....	.....	1	1
21	Fourteenth street SE., between C and South Carolina avenue.	.....	.....	71	.....	.....	.....	4
30	Georgia avenue, between Thirteenth and Fourteenth streets.	.....	.....	106	.....	.....	.....	2
15	I street SW., between Second and Third streets.	.....	.....	14	.....	.....	1	1
1	Kalorama avenue NW., between Eighteenth and Nineteenth streets.	.....	.....	117	.....	.....	.....	3
41	L st. NW., between Twelfth and Thirteenth sts.	.....	.....	8	.....	.....	.....	1
6	M street NW., between New Jersey avenue and First street.	.....	29	.....	.....	.....	.....	1
10	Maryland avenue NE., between Tenth and Eleventh street.	.....	.....	120	.....	.....	1	6
19	Massachusetts avenue, from Sheridan circle westward.	.....	.....	206	.....	.....	1	4
38	Michigan avenue NE., from North Capitol eastward.	.....	.....	543	.....	.....	2	.....
7	North Capitol street, between T and Seaton streets, and in Seaton street, between North Capitol street and Lincoln avenue.	.....	.....	261	.....	.....	1	6
40	Nineteenth street NW., between Cincinnati and Baltimore streets.	.....	118	.....	.....	.....	2	5
39	P street NE., between Florida avenue and North Capitol street.	.....	.....	118	.....	.....	2	5
9	Rhode Island avenue NE., between Fifth and Sixth streets.	.....	.....	151	.....	.....	1	2
4	Seventh street NW., between Philadelphia and Omaha streets.	.....	.....	56	.....	.....	.....	1
18	Sheridan street NW., between Fourteenth and Fifteenth streets.	.....	.....	393	.....	.....	2	4
24	S street NW., between First and North Capitol streets and block 8, Bloomingdale.	11	108	.....	.....	.....	1	7
28	Block 7, Kalorama.	.....	23	.....	.....	.....	.....	1
42	Sheridan street NW., from Fourteenth street westward.	.....	.....	12	.....	.....	.....	1
12	Square north of square 650.	28	101	.....	.....	.....	1	9
3	Thirty-sixth street NW., between Newark and Milwaukee.	243	.....	.....	.....	.....	1	6
11	Tenth st. NE., between F st. and Maryland ave.	140	.....	.....	.....	.....	1	7
13	Thirteenth street NE., between Providence and Fort streets.	.....	152	.....	.....	.....	1	4
16	Square 375.	.....	91	.....	.....	.....	1	5
20	Tenth st. NE., between F st. and Maryland ave.	11	.....	.....	.....	.....	.....	1
22	Thirty-sixth street NW., between Milwaukee and Newark, and in Milwaukee.	294	.....	.....	.....	.....	1	6
29	Reservation 10.	11	69	.....	.....	.....	1	1
31	Twelfth NE., from Dover street southward.	.....	.....	98	.....	.....	.....	1
33	V st. NW., between North Capitol and First sts.	.....	.....	294	289	.....	3	29
Total		859	1,375	3,558	968	34	37	188

<sup>1</sup> Awaiting bill for repairs to pavements.<sup>2</sup> Applicant notified to deposit \$4.33 to balance this account.<sup>3</sup> See report for main and pipe sewers.<sup>4</sup> Balance carried forward to No. 37 permit.

and permit work, and whole cost to applicant for the fiscal year 1900.

SYSTEM.

Amount of deposit.	Cost to District of Columbia.	Cost to property owner.	Total cost.	Amount returned.	For whom done.	Overseer.	Date of completion.
\$200.00	\$145.22	\$145.23	\$290.45	(1)	C. H. Harding .....	Ward .....	.....
124.00	69.69	69.70	139.39	54.30	J. A. Wynkoop .....	Lanigan .....	Aug. 4, 1899
26.00	21.22	21.22	42.44	4.78	Joshua N. Warfield .....	Prince .....	Dec. 14, 1899
45.00	53.65	* 45.00	98.65	.....	Henry Farquhar .....	Lanigan .....	Apr. 25, 1900
92.00	92.00	92.00	* 184.00	.....	Mrs. S. L. Palmer .....	Ward .....	Nov. 15, 1899
665.00	352.50	352.51	705.01	(4)	Thos. J. Fisher & Co. ....	.....do .....	Apr. 27, 1900
(6)	307.38	307.37	614.75	5.12	.....do .....	.....do .....	May 7, 1900
50.00	40.65	40.66	81.31	9.34	Warren Bates .....	Lanigan .....	Apr. 20, 1900
129.00	127.37	127.38	254.75	1.62	Jas. F. Barbour .....	Ward .....	Mar. 12, 1900
379.50	290.19	290.19	580.38	89.31	H. Rozier Dulaney .....	Prince .....	Nov. 22, 1899
148.00	100.80	100.80	201.60	* 47.20	L. McClelland .....	Ward .....	.....
12.00	7.03	7.03	14.06	4.97	J. T. Coghill .....	Thomas .....	Sept. 9, 1899
21.00	14.24	14.25	28.49	8.75	Building committee, German Baptist Brethren Church. ....	.....do .....	Aug. 16, 1899
350.00	280.55	280.55	561.10	69.45	R. E. Middaugh .....	Ward .....	Sept. 14, 1899
30.00	30.00	30.00	60.00	.....	John Kraus & Son .....	Condon .....	Sept. 27, 1899
53.00	43.52	43.52	87.04	9.48	John Cook .....	Lanigan .....	Oct. 18, 1899
105.00	62.03	62.04	124.07	42.96	Geo. S. Cooper .....	.....do .....	Feb. 5, 1900
30.00	19.46	19.46	38.92	10.54	Albert Anderson .....	.....do .....	Nov. 7, 1899
85.00	65.59	65.59	131.18	19.41	John H. Noland .....	.....do .....	July 18, 1899
8.80	8.01	8.02	16.03	.78	H. Friedlander .....	Thomas .....	June 25, 1900
22.00	18.29	18.29	36.58	3.71	Dr. Arthur C. Merriam .....	Ward .....	Aug. 9, 1899
210.00	79.86	79.86	159.72	(7)	A. W. Mallery & Co. ....	Prince .....	Sept. 25, 1899
175.00	133.94	133.94	267.88	41.06	Chas. W. King .....	Ward .....	Nov. 18, 1899
580.00	539.79	539.79	1,079.58	40.21	The Sisters of Notre Dame .....	Prince .....	May 21, 1900
213.00	187.12	187.12	374.24	25.88	Ray E. Middaugh .....	Ward .....	Oct. 17, 1899
117.50	98.37	98.37	196.74	19.13	R. W. Walker & Son .....	.....do .....	May 24, 1900
125.00	113.73	113.74	227.47	11.26	Samuel Ross .....	Thomas .....	June 30, 1900
126.00	105.74	105.75	211.49	20.25	Daniel & Armat .....	Ward .....	Aug. 21, 1899
50.00	28.39	28.39	56.78	21.61	B. H. Warner .....	Lanigan .....	Aug. 1, 1899
340.00	267.77	267.78	535.55	72.22	Chas. W. King .....	Ward .....	Oct. 12, 1899
93.00	89.48	89.48	178.96	3.52	John W. Gregg .....	.....do .....	Dec. 22, 1899
20.00	11.75	11.75	23.50	8.25	Paul J. Pels .....	Lanigan .....	Jan. 12, 1900
15.00	13.02	13.01	26.03	1.99	Jennette and J. H. Lenman .....	Ward .....	June 19, 1900
103.00	52.41	52.41	104.82	50.59	John Miller .....	.....do .....	Aug. 30, 1899
165.00	146.39	146.39	292.78	18.61	Mrs. B. S. Robinson .....	Lanigan .....	July 22, 1899
(8)	74.33	74.33	148.66	55.81	A. W. Mallery & Co. ....	Prince .....	Sept. 25, 1899
122.00	118.78	118.78	237.56	3.22	E. Southall .....	Ward .....	Sept. 7, 1899
80.00	80.00	80.00	160.00	.....	F. B. Pyle .....	.....do .....	Oct. 14, 1899
7.00	5.41	5.41	10.82	1.59	J. T. Moxley .....	Lanigan .....	Oct. 17, 1899
194.50	150.04	150.05	300.09	44.45	H. L. Rust .....	Prince .....	Oct. 25, 1899
87.50	69.39	69.40	138.79	18.10	J. Lewis Davis .....	Lanigan .....	Feb. 12, 1900
85.00	72.28	72.28	144.56	12.72	Chas. Harbaugh .....	.....do .....	Mar. 15, 1900
499.00	406.32	406.33	812.65	92.67	Wm. J. Palmer .....	Thomas .....	Apr. 21, 1900
5,984.80	4,993.70	4,985.17	9,978.87	944.86			

\* Balance brought forward from No. 34 permit.

\* Work incomplete; balance carried forward to fiscal year 1901.

\* Balance carried forward to No. 11 permit.

\* Balance brought forward from No. 10 permit.

TABLE

No. of order.	Location.	Pipe sewers laid (length in			
		8-inch.	10-inch.	12-inch.	18-inch.
123	A street SE., between Seventeenth and Eighteenth streets.			439.7	
120	Block 10, Bloomingdale.			48	
128	Bennings road NE., between Sixteenth and Seventeenth streets.			119	
116	Brightwood avenue NW., between Steuben and Wallach streets.			320	
132	District building, subbasement.				
133	D street NW., between Twenty-second and Twenty-third streets.			312	
103	E street NW., between Seventeenth and Eighteenth streets.			132	
111	Eighteenth and F streets NW. (northwest corner).				
135	Eighth street NW., between Quincy and Omaha streets.			710	
147	Eleventh and K streets NE. (northeast corner).				
156	Elm street NW., between Le Droit and Harewood avenues.			328	
114	Fourteenth street and Columbia road NW. (southwest corner).			12	
119	Square 594		176.5		
126	Fourteenth street SE., between Massachusetts avenue and A street.			192	
127	Fourteenth street NW., between Huntington place and Binney street.			260.8	
134	Square 534			6	
141A	do.	75			
142	Canal street SW., between First and M streets.			70	
145	Fourteenth and A streets SE. (northwest corner).				
146	Fifteenth and B streets SE. (northwest corner).			33	
148	Square 484			120	
160	Fourteenth street SE., between C street and South Carolina avenue.		267		
129	Georgetown and Rockville road, between Thirty-fifth street and Industrial School.		858		
	Georgetown and Rockville road, between Thirty-fifth street and Tunlaw road.		1,588.3	194	
117	Half street SW., between H and I streets.			275.5	
131	Harewood avenue, between Florida avenue and T street.			162.5	
158	Half street SW., between G and H streets.			310	
121	I street NW., between Twenty-first and Twenty-second streets.			251.5	
149	Lanier avenue, between Adams Mill road and Ontario avenue.			399	
130	Maryland avenue NE., between First and Second streets.		91		
138	M street NE., between First and North Capitol streets.		201.5	397	
125	Milwaukee street NW., between Eighteenth and Nineteenth streets.			370	
124	North Carolina avenue SE., between Third and Fourth streets.		56	185	
137	N street NW., between Thirtieth and Thirty-first streets.			450	
	North Capitol and First streets, between T and V streets.		1,339	1,376	73
101	South half of square 150.			407.5	
102	North half of square 150.			94.5	
153	O street NW., between Twenty-seventh and Twenty-eighth streets (south side).			177	
157	O street NW., between Twenty-seventh and Twenty-eighth streets (north side).			176	
164	O street NW., between Twenty-eighth and Twenty-ninth streets (north side).			133	
159	O street NW., between Twenty-eighth and Twenty-ninth streets (south side).			127	
151	Princeton street NW., between Sherman avenue and Thirteenth street.			172	
109	Square 70.	80	110	118.5	
113	S street NW., between Nineteenth and Twentieth streets.	103			
154	Seaton street NW., between First street and Le Droit avenue.			254	

<sup>1</sup> Constructing locker.<sup>2</sup> Work performed at request of surface department.<sup>3</sup> Constructed under contract No. 2742 by E. G. Gummel.<sup>4</sup> Awaiting bill for repairs to pavements.

# OPERATIONS OF THE ENGINEER DEPARTMENT, D. C. 49

ment system.

Building and Junked.	Building con- structed.	Manholes.	Branches.	Cost to District of Columbia.	Cost to property owners.	Total cost.	Overseer.	Date of com- pletion.
		2	7	\$356.38	\$356.38	\$712.76	Lanigan	Jan. 8, 1900
	1	2	7	37.45	37.45	74.90	Ward	Nov. 8, 1899
				104.86	104.87	209.73	do	June 11, 1900
		2	16	247.74	247.73	495.47	Lanigan	Apr. 14, 1900
				10.04		10.04		1 Feb. 9, 1900
		2	12	243.89	243.89	487.78	Ward	Feb. 16, 1900
			3	92.49	92.48	184.97	Lanigan	Aug. 18, 1899
1		3	2	811.93	811.93	1,623.86	Ward	2 Oct. 10, 1899 Mar. 25, 1900
1		2	20	241.29	241.28	482.57	Lanigan Prince	2 May 18, 1900 June 18, 1900
1						97.32	Condon	2 Nov. 3, 1899
		1	21	143.26	143.27	286.53	Ward	Dec. 11, 1899
		1	6	127.26	127.27	254.53	Lanigan	Jan. 15, 1900
		1		177.64	177.65	355.29	Prince	May 5, 1900
1		1	7	60.18	60.18	120.36	Lanigan	Feb. 10, 1900
			5	39.02	39.03	78.05	do	May 3, 1900
						78.06	do	May 4, 1900
1		1				6.15	do	2 May 11, 1900
						76.31	do	2 May 14, 1900
		1	12	131.06	131.06	262.16	Ward	June 11, 1900
		1	15	168.62	168.62	337.24	Prince	June 27, 1900
		4	25	577.99	578.00	1,155.99	do	Apr. 5, 1900
		7	10	1,300.36	1,300.37	2,600.73	G. M. Thomas	2 Feb. 17, 1900
		2	10	155.83	155.83	311.66	Ward	Oct. 26, 1899
		1	5	143.14	143.15	286.29	do	Feb. 6, 1900
		2	6	158.61	158.61	317.22	Prince	(4)
		1	12	212.72	212.71	425.43	do	Jan. 20, 1900
		1	1	204.97	204.98	409.95	Ward	May 31, 1900
		1	4	85.74	85.74	171.48	do	Feb. 5, 1900
		3	11	467.27	467.27	934.54	do	June 6, 1900
		2	2	285.87	285.88	571.75	Prince	Jan. 17, 1900
		1	15	243.31	243.30	486.61	do	Jan. 25, 1900
		2	10	511.89	511.88	1,023.77	do	(4)
		21				3,528.37	J. A. Neville S. D. Mackey	2 Oct. 17, 1899
		2		282.47	282.47	564.94	Prince	Aug. 5, 1899
		1		64.25	64.25	128.50	do	Aug. 8, 1899
		2	8	180.46	180.46	360.92	Thomas	June 12, 1900
		2	8	212.84	212.84	425.64	do	(4)
			5	110.00	110.00	220	do	(4)
		2	5	198.61	198.61	397.22	do	(4)
		1	4	173.68	173.68	347.36	Ward	June 6, 1900
		3	18	201.47	201.46	402.93	Prince	Nov. 2, 1899
		1	5	60.67	60.67	121.34	Ward	Sept. 30, 1899
		1		104.73	104.73	209.46	Prince	June 8, 1900

<sup>5</sup>Not assessable against abutting property, authorized by appropriation bill for fiscal year 1899; charged appropriation for assessment and permit work, 1899. Constructed under contract by Adam McCandlish.

<sup>6</sup>Work completed in fiscal year 1901.

TABLE 3.—*Assessment*

No. of order.	Location.	Pipe sewers laid (length in feet).					
		8-inch.	10-inch.	12-inch.	18-inch.	21-inch.	24-inch.
106	Sixth street SE., between L and M streets .....			295			
107	Northwest corner Sixth and K streets SE. ....			9			
112	Square 652 .....	104	147				
115	Spring street, between Morris road and Maple avenue.			250			
136	Square 67 .....	80					
104	Square 274 .....			116			
108	Southeast corner Thirty-seventh and K streets ..						
118	Thirty-fourth street NW., between R and S streets.			201.5			
122	Northeast corner Tenth and I streets NE .....						
139	Thirtieth street NW., between N street and Dumbarton avenue.			148.5			
141	Twenty-fifth street NW., between F and G streets.			136.5			
143	Thomas street NW., between First street and Le Droit avenue.			160			
144	Trinidad street NE., northward from King street.			286			
152	Twelfth street NW., between U and V streets. ....		162	66			
155	Twenty-second street NW., between Water and C streets.			329			
163	Twelfth street NE., between Providence and Lansing streets.		149				
110	Virginia avenue SW., between First and Second streets.		188				
100	Water street SW., between M and N streets. ....		300	336.5			
105	Whitney avenue, between Brightwood avenue and Warder street.			300			
	Total .....	442	5,633.3	11,766.5	73	105	6

<sup>1</sup> Work performed at request of surface department.<sup>2</sup> Awaiting bill for repairs to pavements.

Continued.

Basins ad- justed.	Basins con- structed.	Manholes.	Branches.	Cost to District of Columbia.	Cost to property owners.	Total cost.	Overseer.	Date of com- pletion.
	1	2	11	\$230.82	\$230.83	\$461.65	Ward .....	Nov. 8, 1899
		3	28	166.62	166.62	58.97	Lanigan .....	<sup>1</sup> Sept. 4, 1899
		1	4	227.16	227.16	333.24	do .....	Sept. 27, 1899
						464.32	Ward .....	Oct. 21, 1899
		1	5	78.91	78.91	157.82	Lanigan .....	Apr. 6, 1900
		1	6	114.63	114.64	229.27	Prince .....	Aug. 21, 1899
	1					49.58	Lanigan .....	<sup>1</sup> Sept. 20, 1899
		1	10	121.74	121.73	243.47	Prince .....	Oct. 27, 1899
						49.89	Lanigan .....	<sup>1</sup> Dec. 9, 1899
		1	4	141.98	141.99	283.97	Prince .....	June 13, 1900
		1	5	86.81	86.81	173.62	do .....	Apr. 21, 1900
		1	8	83.46	83.46	166.92	Thomas .....	May 1, 1900
		1	8	194.20	194.21	388.41	Ward .....	( <sup>2</sup> )
		2	11	195.96	195.96	391.92	do .....	June 26, 1900
		2	7	232.79	232.79	565.58	do .....	June 21, 1900
			4	121.64	121.64	243.28	Prince .....	( <sup>2</sup> )
		2	9	117.59	117.58	235.17	Lanigan .....	Oct. 13, 1899
		3	18	305.30	305.31	610.61	Prince .....	Aug. 5, 1899
		1	1	186.28	186.29	372.57	do .....	Aug. 15, 1899
1	8	104	438	11,535.90	11,525.93	27,183.43		

<sup>2</sup> Work completed in fiscal year 1901.

TABLE 4.—

No. of order.	Location.	Pipes sewers laid (length in feet).						Manholes.	Basins.	Branches.
		8-inch.	10-inch.	12-inch.	15-inch.	18-inch.	21-inch.	24-inch.		
304	Anacostia and Potomac River R. R. Co., along line of.			54						
307	Southwest corner Eleventh and G streets SE.			9					1	
309	Eleventh street SE., at north approach Navy-Yard Bridge.								1	
315	Eleventh street NW., just north of F street.								1	
317	Eleventh and F streets NW. (northwest corner)			9					1	
314	Fourteenth and D streets NW. (intersection)			30						
318	Fifth street NW., crossing G street.			54						
319	Northeast corner Fourth and R streets NW.			21	51				1	
300	G street, between North Capitol and First streets NW.	6				35	168		1	1
303	Pennsylvania avenue NW., in front of No. 926							3		
311	Prospect street NW., about 50 feet west of Thirty-sixth street.								*1	
320	Pomeroy and Seventh streets (northeast corner).								*1	
321	Rhode Island avenue NW., between Fourteenth and Fifteenth streets.									
308	Square 678.								1	
312	Sixth and B streets NW.								1	
302	Thirteenth and E streets NW. (northwest corner).			24						
313	Third street and Maryland avenue SW. (southwest corner).								1	
316	Northeast corner Thirty-second and P streets NW.			18					1	
310	Southwest corner Virginia avenue and Twelfth street SW.			3					1	
306	Water and P streets SW. (northeast corner).		30							
	Totals.	6	30	222	51	35	168	3	7	6

\* Reconstructing manholes.

\* Chargeable to general deposit.

\* Awaiting bill for repairs to pavements.

\* Work begun in fiscal year 1899; amount expended in fiscal year 1899, \$1,207.56; aggregate cost of work performed, \$2,624.06.

\* Abandoning manhole.

\* Balance brought from job No. 312.

Whole cost.

45 feet diam- eter.	Amount of deposit.	Cost to property owner.	Total cost.	Amount returned.	For whom done.	Overseer.	Date of com- pletion.
.....	(1-2)	\$416.94	\$416.94	.....	Anacostia* and Potomac River R. R. Co.	Condon...	Apr. 14, 1900
.....	(2)	47.27	47.27	.....	do.	Lanigan..	Jan. 10, 1900
.....	(2)	50.26	50.26	.....	do.	do	Jan. 27, 1900
.....	(2)	72.92	(2)	.....	do.	Condon...	
.....	(2)	113.56	113.56	.....	do.	Lanigan..	Apr. 18, 1900
100.19	\$1,056.00	762.71	762.71	\$293.29	do.	do	May 12, 1900
.....	(2)	48.39	48.39	.....	City and Suburban Rwy. Co.	do	May 24, 1900
.....	(2)	152.81	152.81	.....	Anacostia and Potomac River R. R. Co.	Condon...	May 28, 1900
.....	2,624.05	1,416.49	(4)	.....	Government Printing Of- fice.	Ward.....	Aug. 3, 1899
.....	10.00	6.30	\$6.30	3.70	A. B. Mullett & Co	Lanigan..	Oct. 18, 1899
.....	(4)	69.22	69.22	.....	Metropolitan R. R. Co	Condon...	Mar. 19, 1900
.....	(2)	87.72	87.72	.....	Anacostia and Potomac River R. R. Co.	do	May 8, 1900
.....	4.00	1.84	\$1.84	2.16	Theo. F. Swayze.....	Lanigan..	June 9, 1900
.....	35.00	31.61	31.61	3.39	J. Maury Dove	Condon...	Jan. 17, 1900
.....	100.00	86.33	86.33	(10)	Metropolitan R. R. Co	do	Mar. 26, 1900
.....	37.61	37.61	37.61	.....	U. S. Electric Light Co	Lanigan..	Nov. 8, 1899
.....	(2)	46.39	46.39	.....	Anacostia and Potomac River R. R. Co.	do	Mar. 22, 1900
.....	(2)	55.11	55.11	.....	Metropolitan R. R. Co	do	Apr. 26, 1900
.....	(2)	68.03	68.03	.....	Anacostia and Potomac River R. R. Co.	do	Feb. 14, 1900
.....	(2)	27.04	27.04	.....	Capital Traction Co.	do	Dec. 13, 1900
100.19	3,866.66	3,598.55	2,109.14	302.54			

1 \$55.55 charged to general deposit.

2 Manhole reconstructed.

3 Lowering manhole.

10 Balance carried forward to job No. 311.

11 Basin reconnected.

12 Basin connection relaid.

TABLE 5.—Work done by day labor under various  
REPLACING OBSTRUCTED

No. of order.	Location.	Pipe sewers laid (length in feet).							
		6-inch. <sup>1</sup>	8-inch.	10-inch.	12-inch.	15-inch.	18-inch.	21-inch.	24-inch.
422	C street NE., between Fifth and Sixth streets.					63			
408	D street NE., crossing Sixth street				51				
403	E street SE., between Seventh and Eighth streets (north side)	9				278			
426	Eighth street SW., between B and C streets.	36			204				
404	Square 408	48	162		6				
415	Square 512					15	285		
416	Square 421	24				155			
418	Four-and-a-half street SW., between O and P streets	54			549				
419	Four-and-a-half street SW., between K and L streets	30		126	125				
421	Fifth street NW., between P and Q streets.	60			258	226			
424	Fourth street SE., between D and E streets.	42			30		373		
425	Four-and-a-half street SW., between K and L streets (west side).	39		24	252				
438	Fifteenth street NW., between Q and Corcoran streets.	24				114			
401	G street SE., between Fourth and Sixth streets.	60		173	123				
430	G street SE., between Third and Fourth streets.	60						371	
417	H street NW., crossing First street				9		75		
413	Iowa Circle NW., between P and Thirtieth streets (east side).		48	117	93				
405	K street, crossing North Capitol street								33
406	K street NE., between North Capitol and First street.	96							406
409	do.	87					486		
420	L street NW., between Twenty-second and Twenty-third streets					75	248		
410	O street NW., between Thirty-fifth and Thirty-sixth streets				199				
428	Ninth street NW., between French and S streets.	21			13		98		
431	O street NW., between Eighth and Ninth streets.	12	6		83				
412	Pennsylvania avenue SE., between Second and Third streets.	33			398				
423	P street NW., between Seventh and Eighth streets.	15			81				
402	Q street NW., between Sixteenth and Seventeenth streets.						66		
407	Seventh street SW., between F and G streets.	15			15				328
411	Seventeenth street NW., Rhode Island avenue, and N street.	12			136				
427	Square No. 67			192	177				
400	Square No. 208	207		256	247				
414	Square No. 335	99			232	116			
429	Thirteenth street NW., between T and Wallach streets	99			27	21	128	128	
433	Thirteenth street NW., between N and O streets.	36			177	174			
434	Square No. 280	15		217					
	Total	1,233	216	1,105	3,485	1,237	1,759	905	361

<sup>1</sup>Six-inch pipe used in making connections.<sup>2</sup>Net cost is determined by deducting the cost of repairs to pavements and cost of connections from the total cost.<sup>3</sup>Includes \$15.22, cost of work by plumber.<sup>4</sup>Includes \$25.70, cost of work by plumber.<sup>5</sup>Includes \$21.54, cost of work by plumber.<sup>6</sup>Includes \$4.15, cost of work by plumber.<sup>7</sup>Includes \$49.39, cost of work by plumber.<sup>8</sup>Includes \$12.96, cost of work by plumber.

see appropriations, fiscal year 1900.

## SEWERS.

Total relaid.	Connections made.	Manholes.	Branches.	Cost of materials.	Cost of labor.	Cost of repairs to pavements.	Total cost.	Cost of connections.	Net cost of sewer. <sup>2</sup>
78				\$28.85	\$86.50	\$12.02	\$127.97		\$115.35
51		1		33.03	37.70		70.73		70.73
284		1	7	139.48	418.92		558.40		558.40
263	9	1	9	100.75	387.86		488.61	\$40.97	447.64
168		2	15	68.43	140.36	56.42	265.21		208.79
311	1	2	6	188.79	596.22	81.29	866.30	8.89	776.12
157		1	10	100.05	312.58	177.85	590.48	15.22	397.41
549	5	4	9	254.96	839.52	62.26	1,156.74	65.60	1,028.88
255	4	2	16	118.34	315.97	27.27	461.58	27.74	406.57
489	14	2	20	224.15	670.33	62.48	956.96	76.22	818.26
407		3	8	291.85	658.47	60.35	1,010.67		950.32
281	10	3	12	156.38	465.74	86.55	708.67	106.90	515.22
112		1	3	58.69	161.79	16.55	237.03		220.48
486	17	2	17	169.09	678.05	38.45	885.59	62.50	784.64
370			16	328.01	525.20	40.69	893.90		853.21
75	1	1		64.52	171.35	54.00	289.87	16.37	219.50
268		2		97.12	193.22	79.81	370.15		290.34
33		1		56.62	133.37	8.84	198.83		189.99
408	15	2	20	424.94	1,041.09	17.25	1,483.28	50.13	1,415.90
493	24	2	24	344.99	883.65		1,228.64	58.44	1,170.20
330	11	2	9	218.24	568.61	21.28	808.13	25.10	761.75
199		1	5	84.24	234.94	13.97	333.15		319.18
218		2	6	119.38	355.78	32.85	508.01		475.16
91	5		5	32.87	136.59	18.08	187.54	21.36	148.10
404	12	2	16	176.22	504.85	191.23	872.30	29.75	651.32
86	5	1	5	50.24	155.66	18.92	224.82	16.33	199.57
66			3	44.03	149.52	29.35	222.90		193.55
346		2	11	352.72	528.10	208.95	1,089.77		880.82
136			2	44.06	147.19	15.75	207.02		191.27
388		3	9	179.87	490.83	111.76	782.46		670.70
512	29	2	47	229.16	821.34	131.99	1,182.49	118.09	932.41
357		2	36	195.68	528.62	187.18	911.48		724.30
296	7	4	5	286.09	761.63	60.28	1,108.00	228.94	818.78
348	8	4	9	199.21	500.37	65.56	765.14	28.82	670.76
213		1	11	94.71	213.62	18.90	327.23		308.33
3,528	177	59	371	5,555.78	14,815.54	2,008.73	22,380.05	987.37	19,383.95

<sup>9</sup> Includes \$2.75, cost of work by plumber.

<sup>10</sup> Includes \$2.80, cost of work by plumber.

<sup>11</sup> Includes \$4.25, cost of work by plumber.

<sup>12</sup> Includes \$2.96, cost of work by plumber.

<sup>13</sup> Includes \$2.96, cost of repairs to water pipe.

<sup>14</sup> Includes \$22.55, cost of work by plumber.

<sup>15</sup> Includes \$16.45, cost of work by plumber.

<sup>16</sup> Includes \$5.26, cost of work by plumber.

TABLE 6.—*Man.*

No. of order.	Location.	Pipe sewers laid (length in feet).				
		6-inch.	8-inch.	10-inch.	12-inch.	15-inch.
513	District of Columbia, cement house .....					
608	do .....					
566	B street SE., between Eighteenth and Nineteenth streets .....					
577	B street SE., between Eighth and Ninth streets .....			66	3	
523	Canal street SW., between Canal and Half streets and square north of square 650 .....			93	102	
589	Southeast corner of Canal street and Delaware avenue SW .....				27	
537	Southeast corner of Eighth and D streets SE .....				42	
538	Southeast corner of Eighth and E streets SE .....				51	
539	Northeast corner of Eighth and E streets SE .....				12	
540	Square 878, crossing lot 10 .....			6	6	144
569	Northeast corner of Eighteenth and Grant streets NW .....				21	
571	Eighteenth street SE., between A and B streets .....					
606	Northeast and southwest corners Eleventh and W streets NW .....				75	
23 Per.	Canal street SW., between Delaware avenue and South Capitol street .....					
506	Square 534 .....		6		60	218
508	Northwest corner First and Seaton streets NW .....			9		
509	Northeast and southeast corners First and I streets NE .....					72
510	Southeast corner First and K streets NE .....				57	
515	Northeast corner Fourth and A streets SE .....				12	
516	Northeast corner Fourth and B streets SE .....				3	
517	Southeast corner Fifth and C streets SE .....				45	
626	Southeast, southwest, and northwest corners First I streets SE .....	93		39		
533	Southeast corner First and F streets SE .....				33	
534	F street NE., between Eighth and Ninth streets .....					
547	Northwest corner Fourteenth street and Columbia road .....				9	
558	Fourth and Pomeroy streets NW .....				54	
559	Northwest corner First and S streets NW .....				6	
560	Square 594 .....			71		
574	Northwest corner First and B streets NW .....				27	
578	Fourth street SE., between South Carolina avenue and E street .....					
584	Northwest and northeast corners Fourth and V streets NE .....				30	
587	Fourteenth street and Massachusetts avenue SE. (Intersection) .....					42
592	Fourteenth street and Georgia avenue (Intersection) .....				36	
599	Southwest and northwest corners Fourteenth street and Howard avenue NW .....				42	
600	Square 534 .....	30		27	49	103
613	Northwest corner First and N streets SE .....				6	
621	Southwest corner Fourteenth and East Capitol streets SE .....			9		
623	Florida avenue, just west of Harewood avenue .....				18	
629	Northwest corner Florida avenue and Second street NW .....				24	
553	Northeast corner Grant and Sherman avenues NW .....				30	
607	Southwest corner Grant avenue and Ninth street NW .....				30	
520	H street NW., crossing Eighth street .....				12	36
524	H street NE., between North Capitol and First streets .....				3	
551	H street NW., between First and Second streets .....				276	174
624	Southwest and southeast corners Half and I streets SE .....			48		
625	Northeast corner Half and I streets SE .....	60				
536	Indiana avenue NW., between Third and Four-and-a-half streets .....				290	162
379	K street SE., at intersection of Sixth street .....				21	
585	K street SW., between Third and Four-and-a-half streets .....					
588	do .....					
596	K street NW. and Mount Vernon square (crossing) ..					
598	do .....		3	35	12	
500	L street NW., between Twenty-first and Twenty-second streets .....					
502	do .....					
504	M street SW., crossing Water street .....					

<sup>1</sup> 27 corner and 23 side artificial basin tops constructed.

<sup>2</sup> 36 corner and 64 side artificial basin tops constructed.

<sup>3</sup> Basin connection.

<sup>4</sup> Work performed in connection with job No. 23 permit; see report for voluntary system.

778.

id (length t).	2.25 by 3.375.	2 by 3 feet.	Manholes.	Basins.	Branches.	Cost of mate- rials.	Cost of labor.	Cost of repairs to pave- ments.	Total cost.
h. 24-inch.									
						\$107.27	\$139.82		<sup>1</sup> \$247.09
						256.47	208.85		<sup>2</sup> 458.82
8			2			419.44	618.51		1,037.95
			1			36.89	60.87	\$11.88	109.64
			2			79.81	142.54	2.19	224.54
				1		23.16	24.76	4.05	51.97
						12.23	18.74		<sup>3</sup> 30.97
						15.09	34.10	16.12	<sup>3</sup> 65.31
			1			4.30	20.75		<sup>3</sup> 45.05
			1	1		107.42	195.05		302.47
0				1		33.61	28.61		62.22
			1			135.16	496.81		631.97
				2		67.84	90.98	36.37	195.19
									<sup>4</sup> 15.00
			3		10	158.09	429.73	66.17	653.99
				1		28.64	28.86		57.50
				1		53.88	66.62		120.50
				1		39.97	44.63		84.60
				1		28.43	26.31	9.83	64.57
				1		25.33	23.35	9.80	58.48
				1		37.78	47.05	32.71	117.54
				3		80.62	87.61		168.23
				1		34.66	32.16		66.82
9						151.70	232.41	27.71	411.82
				1		28.40	37.06		65.46
				2		67.84	63.70	23.73	155.27
				1		27.56	28.63	6.30	62.49
					1	20.02	69.94	31.02	120.98
				1		32.87	31.47		64.34
4			2			206.78	322.39	23.57	552.74
				2		60.70	61.77		122.47
			1			37.55	52.55		90.10
			1			31.88	70.27		102.15
				2		63.46	75.47	10.50	149.43
			2	1		141.33	288.64	27.13	457.10
				1		27.06	30.23		57.29
				1		26.10	29.50		55.60
				1		30.39	39.18	9.95	79.52
				1		32.41	31.80		64.21
				1		34.00	33.70		67.70
				1		32.67	36.89		69.56
						26.56	44.30	21.79	92.65
				1		25.33	20.19	8.60	54.12
			3			213.06	523.80	230.18	967.04
				2		62.95	75.46		138.41
				1		25.29	34.74		60.03
			2		13	198.10	378.58	<sup>5</sup> 112.07	688.75
				1		31.90	30.19		62.09
2			2		16	278.66	642.53	<sup>6</sup> 44.31	965.50
			2		16	254.59	573.44	36.22	864.25
	224.6		1			418.64	838.52	38.64	1,295.80
84		107.62	2			295.28	677.66	33.56	1,006.50
			1		6	160.22	348.53	<sup>7</sup> 11.97	520.72
			1			13.01	44.00	<sup>8</sup> 35.00	<sup>8</sup> 92.01
5			1			50.68	76.16	16.85	143.69

<sup>2</sup> Cost of repairs to pavements includes \$5.53, cost of work by plumber.

<sup>6</sup> Cost of repairs to pavements includes \$2.64, cost of work by plumber.

<sup>7</sup> Cost of repairs to pavements includes \$5.47, cost of work by plumber.

<sup>8</sup> Work begun in fiscal year 1899.

TABLE 6.—Main and

No. of order.	Location.	Pipe sewers laid (length in feet).				
		6-inch.	8-inch.	10-inch.	12-inch.	15-inch.
528	Maryland avenue NE., between Tenth and Eleventh streets.....				126	
567	Massachusetts avenue, 12 feet west of Sheridan circle.....				18	
591	Maryland avenue NE., crossing Second street.....			72		
614	M street NE., between North Capitol and First streets.....			78		
620	Massachusetts avenue and A street SE. (northeast corner).....			9		
550	Morris road, about 200 feet above Spring street.....				21	
581	Ninth and L streets SE.....					27
582	New Jersey avenue and F streets SE. (northeast corner).....				72	
535	North Capitol street at northeast corners of T and U streets.....				24	
544	N street NW., between Seventeenth street and Scott circle.....				187	
555	Ninth and Hartford streets NE. (southeast corner).....				27	
586	North Carolina avenue, between Third and Fourth streets SE.....				50	
590	Nineteenth street NW., between Florida avenue and Columbia road.....				141	
595	Ninth street NW., between R and French streets.....					
612	N street NW., between Twenty-ninth and Thirtieth streets.....					283
568	Reservation 126.....			36	174	
628	O street NE., between North Capitol and First streets.....				27	
503	P street NW., between First and Third streets.....					
530	Pennsylvania avenue SE., between Twelfth and Thirteenth streets.....				60	42
563	P street SW., between Four-and-a-half and Water streets.....					261
511	Second and R streets NE.....			6		
522	Square 720.....			3		
543	Square 70.....				63	
545	S street NW., between Nineteenth and Twentieth streets.....		130	27		
561	Scott circle NW. (north and west roadways).....				39	96
562	Scott circle NW.....				153	
576	South Carolina avenue SE., between Third and Fourth streets.....					
583	Second and F streets SE. (northeast and southeast corners).....		48			
615	S street NW., between Thirty-fourth and Thirty-fifth streets.....				260	
622	Second and L streets SW. (northwest and southwest corners).....				54	
627	Sheridan circle (north side on outer curb).....				84	
505	Sixth street and Pennsylvania avenue NW. (northeast and northwest corners).....					27
518	Sixth and A streets SE. (northeast corner).....					
519	Sixth street, between E and F streets NE.....					
521	Sixth street NE., between D and E streets.....					477
529	Sixth and M streets SE. (northeast corner).....				9	
549	Sixth street SE., between C street and North Carolina avenue.....					
570	Square 620.....				3	162
581	Sixth and F streets NE. (northeast corner).....				298	
594	Square 676.....				45	
610	Sixth and Pomeroy streets NW. (northwest and southwest corners).....	3		6		10
501	Thirteenth street NE., between H and I streets.....				42	
507	Thirteenth street NW., between G and H streets.....					448
512	Tenth and Concord streets NE. (northeast corner).....				24	
514	Third and B streets SE. (northeast corner).....				33	
525	Tenth and V streets NW. (northeast corner).....				39	
526	Tenth and V streets NW. (northwest corner).....				6	
527	Tenth and W streets NW. (northwest corner).....				9	
541	Twenty-seventh and I streets NW.....				33	
542	Twenty-fourth and M streets NW. (southeast and southwest corners).....			24		
548	Thirty-sixth street NW., between O and P streets.....			152		
552	Square 1202.....				3	
554	Tenth and F streets NE. (southeast corner).....					
556	Twelfth and Joliet streets NE. (northeast corner).....					30
557	Thirty-sixth and P streets NW.....					54
564	Third street SW., just south of N.....					48

<sup>1</sup> Connections for two catch basins.<sup>2</sup> Appropriation reimbursed out of deposit, City and Suburban Rwy. Co.<sup>3</sup> Awaiting bill for repairs to pavements.

Continued.

1 (length 24-inch.	2.25 by 3.375.	2 by 3 feet.	Manholes.	Basins.	Branches.	Cost of materials.	Cost of labor.	Cost of repairs to pave- ments.	Total cost.
			1	1	3	\$55.35	\$105.57	\$9.64	\$170.56
						31.07	35.07		66.14
						19.77	64.94	17.00	101.71
			1		3	38.12	117.39	10.60	166.11
				1		27.23	27.83		55.06
				2		78.85	62.64		140.99
				1		35.38	29.84		65.22
				1		45.60	63.96		109.56
				2		55.84	63.69		119.53
			2		2	93.72	190.72	13.02	297.46
				1		34.96	40.17		75.13
					1	35.87	86.04	10.13	132.04
72			3	6		326.26	409.07		735.33
			2		6	191.18	461.08	47.81	700.07
			2		7	144.42	269.55	32.81	446.78
			1	8		267.04	269.56		536.60
				2		57.28	100.35		157.63
			3		5	281.64	521.72	12.38	815.74
						40.56	79.10		119.66
			2		8	201.93	501.53	153.69	857.15
				1		14.35	15.15		29.50
				1		18.64	15.70		34.34
			2			52.19	73.69	23.84	149.72
			1		2	49.31	154.36	7.45	211.12
			2			240.69	410.81	80.32	731.82
				5		167.39	194.19		361.58
405			3		6	447.47	797.61	10.31	1,255.39
			2			58.55	49.96		108.51
			1		1	113.99	282.56		396.55
				2		65.17	80.82		145.99
				1		50.02	74.99		125.01
				2		59.54	81.90		141.44
				1		24.50	23.55	4.65	52.70
			3			182.21	533.99	5.67	721.87
			2			234.27	514.65	48.20	797.12
				1		28.06	16.13		44.19
			1			84.33	113.64	17.31	215.28
			3		14	148.65	291.40	16.07	456.12
				1		38.99	44.86	13.68	97.53
				1	2	33.51	52.44		85.95
				2		64.05	71.55	17.04	152.64
			1			15.90	33.09	57.10	106.09
			3		20	269.69	570.54	94.11	934.34
				1		33.02	43.41		76.43
				1		33.58	35.44	24.49	93.51
				1		36.84	19.40		56.24
				1		25.69	38.31		64.00
				1		26.26	21.73		47.99
				1		34.66	35.86		70.52
				2		55.51	47.61		103.12
			1		7	65.93	188.65	3.89	258.47
			2			144.87	327.30		472.17
				1		27.19	26.86		54.05
				1		34.78	44.23		79.01
				2		67.48	73.61		141.09
				1		39.65	44.81		84.46

in fiscal year 1899: cost of repairs to pavements includes \$19.84, cost of work by  
s to pavements includes \$21.13, cost of work by plumber.

TABLE 6.—*Main and*

No. of order.	Location.	Pipe sewers laid (length in feet).				
		6-inch.	8-inch.	10-inch.	12-inch.	15-inch.
573	Square 281.....			84		
580	Thirty-seventh and V streets NW.....				51	
582	Thirty-seventh and W streets NW. (northeast corner).....				21	
593	Twenty-second street NW., between C and D streets.....			54		
601	Twelfth and W streets NW. (northeast corner).....				15	
602	Thirteenth and V streets NW. (northeast corner).....				36	
603	Thirteenth and W streets NW. (northeast and north-west corners).....				42	
604	Thirteenth and U streets NW. (northeast corner).....				12	
606	Twelfth and V streets NW. (northeast corner).....				12	
609	Square 399.....	129			234	27
611	Thirteenth and Columbia streets NW. (southwest corner).....				30	
616	Square 236.....					
617	Square 293.....				198	
618	Thirty-third and R streets NW. (northeast corner).....			36		
619	Thirty-second and R streets NW. (northwest corner).....			60		
546	University place, opposite Euclid place NW.....			12		
575	Virginia avenue SW., just west of Delaware avenue.....				51	
572	W street NW., between Thirteenth and Fourteenth streets.....			188		
565	Around Hubbard School Building.....					
	Total.....	315	187	1,258	4,482	3,141

<sup>1</sup> Leveling dirt dumped on vacant lot.

# OPERATIONS OF THE ENGINEER DEPARTMENT, D. C. 61

pipe sewers—Continued.

Pipe sewers laid (length in feet).			2.25 by 3.375.	2 by 3 feet.	Manholes.	Basins.	Branches.	Cost of materials.	Cost of labor.	Cost of repairs to pavements.	Total cost.
18-inch.	21-inch.	24-inch.									
					1			\$39.46	\$71.85	\$4.90	\$116.21
						2		61.29	51.89		113.18
						1		32.39	31.75		64.14
					1			32.41	56.02		88.43
						1		28.65	25.61	10.34	64.59
						1		34.75	38.57	6.09	79.41
						2		61.87	71.91	29.44	163.22
						1		27.68	24.33	4.17	56.18
						1		28.63	24.68	5.11	58.42
					4		41	296.14	850.56	98.48	1,245.18
						1		33.30	41.00		74.30
									4.09		4.09
					1		6	77.16	218.61	40.86	336.63
						1		35.18	37.26	36.68	109.12
						1		38.85	48.35		87.20
						1		29.13	36.90		65.93
					1	1		49.32	49.82	7.82	106.96
					1		10	70.58	186.03	11.81	268.42
								26.10	81.31		\$107.41
1,473	2,302	561	224.6	107.62	86	106	206	11,063.45	19,599.97	1,925.13	32,603.55

<sup>1</sup> Constructing broken-stone drain; appropriation reimbursed out of appropriation, "Repairs to school buildings, 1900."

TABLE 7.—Subur

No. of order.	Location.	Pipe sewer laid (length in feet).		
		8-inch.	10-inch.	12-inch.
824	Arizona avenue, between New Cut road and Aqueduct road .....			
801	Block No. 9, Bloomingdale .....			
810	Bennings road, between Fifteenth and Sixteenth streets .....	88		
813	Block No. 10, Bloomingdale .....			75
814	Concord street NE., between Twelfth and Thirteenth streets .....			
806	Fifth street NE., crossing Rhode Island avenue .....			
811	Ingleside terrace, between Eighteenth and Nineteenth streets .....			
821	King street NE., at intersection of Trinidad street .....			
822	Lowell street NE., between Seventh and Eighth streets .....			
809	Massachusetts avenue NW., from Sheridan circle westward .....			
800	Nineteenth street NW., between Kalorama avenue and Woodley road .....			
802	New Hampshire avenue and Seventh street NW., between Philadel- phia and Quincy streets .....			
804	North Capitol street, between S and Seaton streets (east side) .....			
805	North Capitol street, between S and Seaton streets (west side) .....			
819	Nineteenth street NW., at California avenue (crossing) .....			69
817	Omaha street NW., between Fifth street and Rock Creek Church road .....		80	303
815	Providence street NE., between Ninth and B. & O. R. R. .....			
812	Randolph street NW., between First and North Capitol streets .....			
803	S street NW., between First and North Capitol streets .....			
818	Seventeenth street NE., between Gales street and Bennings road .....		24	21
823	Seaton street NW., between First street and Le Droit avenue .....			
808	Steuben street NW., between Sherman and Brightwood avenues .....			3
807	Thirteenth street NE., between Providence and Fort streets .....		146	
820	Thomas street NW., between First street and Le Droit avenue .....			
816	Thirty-seventh street NW., between U and V and in Block No. 138, Burleith .....			
	Total .....	88	250	471

# OPERATIONS OF THE ENGINEER DEPARTMENT, D. C. 63

san sewers.

Pipe sewer laid (length in feet).				Man-holes.	Branches.	Cost of materials.	Cost of labor.	Cost of repairs to pavements.	Total cost.
15-inch.	18-inch.	21-inch.	24-inch.						
		321		2	6	\$315.70	\$34.51		<sup>1</sup> \$34.51
				1	5	84.62	608.14		923.84
						25.61	98.79		183.41
						182.08	57.63		84.24
257				1	1	325.69	325.69		457.72
	51			1		47.01	88.04		135.05
	612			2		372.45	701.77		1,074.22
	18			1		30.54	42.91		73.45
		341		1	7	300.12	476.13		776.25
30				1		32.36	59.30	\$5.16	96.82
	396			2	4	256.26	538.16		794.42
	51	204		2		232.05	344.86		576.91
243	57			2		171.53	321.59	25.80	518.92
118				1	2	69.84	163.09	23.58	256.51
				1		88.40	72.22		110.62
				1	1	180.83	288.41		419.24
206				1	4	116.84	528.28		645.12
300				2		166.60	332.73	31.48	530.81
	139			1	5	98.57	179.31		277.88
428				3	7	249.86	437.04	10.74	697.64
210				2		110.75	180.01	26.79	317.55
	234			1	9	152.22	263.08	11.44	426.74
				1	4	58.17	135.43		193.60
167	171		65	2	10	256.49	362.79	11.64	630.92
	162	120		2		221.06	332.71		553.79
1,959	1,893	986	65	34	65	3,620.93	6,972.62	146.63	10,740.18

<sup>1</sup> Digging test holes.

TABLE 8. *Miscellaneous appropriations in*

No. of order.	Location.	Pipe sewer laid (length in feet).			
		6-inch.	10-inch.	12-inch.	15-inch.
1031	Bladensburg road, north of H street NE .....				
1013	Whitney avenue, between Brightwood avenue and Sherman avenue .....				
1011	Northeast corner Delaware avenue and C street NE.....			18	
1007	Southeast corner Eighth and R streets NW .....				3
1026	Northeast and southeast corners Fifteenth street and Pierce place, NW .....				
1027	Northwest corner Sixth and B streets NW .....	30			
1005	Northeast corner Eleventh and East Capitol streets .....				
1006	Northwest corner Eleventh and B streets NE .....			39	
1017	Northeast and southeast corners Eleventh and F streets NE .....				
1002	Southeast and southwest corners Fourth and D streets NE .....			15	
1003	Southeast and southwest corners Fifth and D streets NE .....			12	
1016	Southeast corner Ninth and F streets NE .....				
1032	Northwest corner New York avenue and First street NE .....			18	
1004	Southwest and southeast corners Sixth and D streets NE .....			9	
1021	Northwest, northeast, southwest, and southeast corners Sixth and G streets NE .....			9	
1023	Southeast corner Sixth and Morris streets NE .....				
1001	Southeast corner Third and D streets NE .....			12	
1009	Northeast corner First and Heckman streets SE .....				
1000	Northeast and southeast corners North Carolina avenue and First street SE .....		12		
1029	Southeast corner South Capital and I streets SE .....				
1020	Northwest, northeast, and southeast corners Third street and South Carolina avenue SE .....			78	
1015	First and O streets NW .....				
1012	Northwest corner Third and P streets, northwest and southwest, southeast and northeast corners Third and Q streets NW .....			27	
1019	First and E streets SW .....				
1030	Northeast corner Massachusetts avenue and Sheridan circle .....			18	
1024	Northwest corner O and Thirty-sixth streets, and north side P street NW., at Thirty-sixth street .....				
1018	Southwest corner Thirty-sixth and P streets NW .....				
1028	Thirty-third and R streets NW .....			45	
1008	Northwest corner Seventh and D streets SE .....			3	
1025	Wilson street NW., between Harewood avenue and Larch street .....				
	Pennsylvania avenue NW .....				
	do .....				
	U. S. Capitol grounds, between First street and New Jersey avenue NW .....				
	Total .....	30	12	303	3

<sup>1</sup>Includes \$5.07, cost of repairs to pavements.

<sup>2</sup>Includes \$6.54, cost of repairs to pavements.

<sup>3</sup>Includes \$12.57, cost of repairs to pavements.

<sup>4</sup>Roping off Pennsylvania avenue, Admiral Dewey parade.

## AUTOMATIC FLUSHING TANKS.

No. of order.	Location.	4-inch lead pipe.
1	West side Thirty-second street NW., south of Tunlaw road .....	27
2	East side of Thirty-second street NW., at Observatory avenue .....	38
3	Highland avenue, east of Thirty-fourth street .....	5
4	Eighth street NW., north of Omaha street .....	5
5	Flint street, Brightwood Park, east of Illinois avenue .....	
	Total .....	75

fiscal year 1900, work performed by day labor.

Basins ad- justed or recon- structed.	Man- holes ad- justed.	Basins.	Cost of material.	Cost of la- bor and contingen- cies.	Total cost.	Appropriations.
1		3	\$53.98	\$3.97	\$3.97	Repairs to roads, 1900.
		1		77.30	131.28	Do.
		1	31.14	148.08	79.22	Repairs to streets, 1900.
		1	25.06	24.21	49.27	Do.
		2	62.88	52.39	104.77	Do.
		1	33.05	41.15	74.20	Do.
		1	25.06	23.98	49.04	Improvements and repairs, north- east section, 1900.
		1	32.16	37.78	69.94	Do.
2			.53	9.08	9.61	Do.
		2	53.33	48.30	101.63	Do.
		2	43.93	43.65	87.58	Do.
		1	11.95	29.19	41.14	Do.
		1	22.27	40.23	62.50	Do.
		2	44.18	51.81	95.49	Do.
		4	100.26	120.95	221.21	Do.
		1	16.66	33.15	49.81	Do.
		1	28.62	29.78	58.40	Do.
1			16.66	20.50	37.16	Improvements and repairs, south- east section, 1900.
		2	34.94	52.67	87.61	Do.
			1.82	6.29	8.11	Do.
1		3	99.41	117.39	216.80	Do.
			1.94	14.64	16.58	Improvements and repairs, north- west section, 1900.
		4	106.97	135.56	242.53	Do.
2			.89	7.94	8.83	Improvements and repairs, south- west section, 1900.
		1	22.87	35.69	58.56	Paving Sheridan circle, 1900.
2				5.37	5.37	Improvement and repairs to Georgetown, 1900.
1			.89	7.48	8.37	Do.
1		1	37.63	\$ 52.48	90.11	Do.
		1	25.53	28.58	54.11	D street SE., 1900.
		2	12.64	23.11	35.75	Grading and regulating Wilson street.
			19.94	\$ 382.26	\$ 402.20	Emergency fund.
			23.65	\$ 257.25	\$ 280.90	Do.
			165.21	156.87	\$ 322.08	North portion Tiber Creek and New Jersey avenue high level intercepting sewer.
12	2	36	1,145.55	2,018.58	3,164.13	

<sup>1</sup> Includes \$24.78, cost of repairs to pavements.

<sup>2</sup> Roping off Pennsylvania avenue, Nobles of Mystic Shrine parade.

<sup>3</sup> Boarding over sewer in roadway and in foot walks.

#### AUTOMATIC FLUSHING TANKS.

8-inch terra-cotta pipes.	6-inch terra-cotta pipes.	Flushing basin.	Cost of ma- terials.	Cost of labor.	Cost of work by plumber.	Cost of re- pairs to pavements.	Total cost.
3		1	<sup>1</sup> \$68.83	\$74.59	\$2.50	\$6.04	\$151.46
3		1	<sup>1</sup> 72.84	85.93	2.50	13.09	174.36
		1	46.78	75.57	6.12		128.47
	3	1	<sup>1</sup> 55.51	68.02	3.00		126.53
		1	<sup>1</sup> 58.30	81.19	4.75		144.24
6	3	5	301.76	385.30	18.87	19.13	725.06

<sup>1</sup> Includes \$3, cost of tapping water main.

TABLE 9.—Average cost of materials and labor per linear foot of pipe sewers constructed by day labor, also average cost of basins.

[In this table it is assumed that the cost of materials used in basin connections is the same as that in the same size sewer; it is also assumed that on account of the difference in depth of excavation the cost of labor is half the cost of that of the same size sewer. This table does not embrace the cost of work of exceptionally difficult construction.]

Size of sewer.	Length.	Cost of materials.	Cost of labor.	Total cost.
	<i>Feet.</i>			
8-inch.....	1,531	\$0.319	\$0.796—	\$1.115—
10-inch.....	5,207	.394	.876+	1.27+
12-inch.....	16,885	.437	1.044—	1.481
15-inch.....	5,736	.572	1.219—	1.791—
18-inch.....	3,309	.666	1.344+	2.01+
21-inch.....	3,270	.758	1.512+	2.27
24-inch.....	470	1.094	1.98—	3.074
8-inch connection.....	48	.319	.398	.717
10-inch connection.....	273	.394	.438	.832
12-inch connection.....	2,364	.437	.522	.959
15-inch connection.....	276	.572	.609	1.181
18-inch connection.....	69	.666	.672	1.338
24-inch connection.....	72	1.094	.99	2.084
Catch-basins.....	141	22.86	25.526	48.386

TABLE 10.—Number of foremen, inspectors, and other employees of the sewer division, inspector of asphalt and cements office, engineer stables, and cement house temporarily required, and appropriation from which paid for year ending June 30, 1900.

Class.	Number employed.	Cleaning and repairing sewers and basins.	Replacing obstructed sewers.	Main and pipe sewers.	Suburban sewers.	Assessment and permit and whole cost.
Foremen.....	11	\$6,336.53	\$977.50	\$1,392.00	\$491.00	\$1,643.59
Inspectors.....	14	311.00	176.00	1,403.00	1,627.50	386.00
Other employees.....	329	27,920.83	14,450.55	22,633.53	8,418.08	22,457.44
Total.....		34,568.36	15,604.05	25,428.53	10,536.58	24,487.03

Class.	Tiber Creek and New Jersey avenue high-level intercepting sewer.	North portion Tiber Creek and New Jersey avenue high-level intercepting sewer.	Rock Creek and B street intercepting sewer.	Emergency fund.	Automatic flushing tanks.	East side intercepting sewer, Twelfth street SE., and pumping station.	Extension of boundary sewer.
Foremen.....				\$107.75	\$35.00		
Inspectors.....	\$3,142.12	\$2,152.00	\$150.00			\$929.50	\$199.00
Other employees.....	1,956.85	1,853.52		594.41	359.57	732.37	837.85
Total.....	5,098.97	4,005.52	150.00	702.16	394.57	1,661.87	1,036.85

## REPORT OF THE INSPECTOR OF PLUMBING.

WASHINGTON, D. C., August 7, 1900.

CAPTAIN: I have the honor to submit the eighteenth annual report of the division of plumbing inspection for the fiscal year ended June 30, 1900.

## INSPECTIONS AND RECORDS.

The total number of inspections under the direction of this office was 23,015, or, excluding 5,800 inspections of hydrants, 17,405, a decrease of 197 from those of the previous year. These comprise 4,929 examinations of existing plumbing; 5,841 inspections of remodeling, extensions, and repairs; 3,213 inspections of plumbing in new buildings; 194 peppermint tests; 1,055 inspections of gas piping or gas fixtures; 561 inspections of lead water-service pipes; 587 sewer laterals tapped into main sewers; 229 new terra-cotta house sewers, and 796 repairs to terra-cotta sewers

inspected. The number of notices personally served upon property owners preparatory to prosecution was 13.

The amount of office work performed shows a considerable increase, largely due to the added work connected with hydrant inspections and notices. The number of letters, orders, and indorsements amounts to 3,258, the detail of which includes miscellaneous letters, 644; letters to master plumbers, 127; orders to repair plumbing or gas fitting, 522; hydrant replacement orders, 1,132; indorsements on communications forwarded, 720, and letters to the Engineer Commissioner and other District officials, 113.

The number of new buildings for which plumbing designs have been approved is 736, including some noteworthy structures, such as the new Willards Hotel, the Bond office building, the municipal library, Trinity College, and the elegant residences of Herbert Wadsworth, Wayne MacVeagh, and Beriah Wilkins.

The amount of supervision exercised in the design of the new District buildings was greater than in past years, attention having been given to the plumbing proposed for the two manual training high schools and numerous other new schools and fire-engine houses, as well as to the preparation of special plumbing appliances for the new workhouse.

The plumbing conveniences installed in the Evening Star building, recently completed, are eminently in keeping with the other details of this incomparable structure.

#### YARD HYDRANT INSPECTIONS.

On December 6, 1899, this office was, by order of the Commissioners, charged with the work of inspection of yard hydrants, previously performed by the water department, and the service and execution of notices upon defective hydrants of the Eclipse type.

In each of the cases referred to this office, aggregating 4,924, the hydrant had been previously inspected and found to be in defective or leaky condition. Each hydrant was reinspected under my direction and a notice to repair the fixture or to replace it with a hydrant of the non-wasting type mailed to the owner or agent.

The number of hydrant inspections was 5,800; of repair notices issued, 1,493; of replacement orders, 1,132. The new hydrants installed, of which this office has information, number 933, and the hydrants removed 100.

#### PLUMBING REGULATIONS.

No general revision of the plumbing regulations having been undertaken since their promulgation on February 15, 1893, although a few changes were made in the third edition, published in 1897, the plumbing board was directed by the Engineer Commissioner to give consideration to certain obvious and necessary changes to bring them into conformity with the best practice elsewhere and the later plumbing laws involving licensing of master plumbers. As the revision proceeded, the board found it necessary to make material changes in about one-fourth of the regulations, comprising mostly those relating to house plumbing. As these amendments do not take effect till January 1, 1901, their force will not be felt upon the work of the office until the latter portion of the current year, but it is certain that they will somewhat increase the number of inspections.

The introduction of important schedules of sizes for soil, waste, and vent pipes is a notable advance upon previous regulations where incidental restrictions only have been imposed upon the size of pipes used. The prohibition of the construction and maintenance of indirectly connected plumbing fixtures will tend to prevent many constant sources of nuisance. The practice of this office has, under the old regulations, not been equal to the best in other cities in respect to the examinations and tests required of completed plumbing work, but the new requirements in this regard will add an assurance now lacking as to the security of new plumbing and piping systems. The indefiniteness which has existed as to the applicability to cases of repairs and remodeling of regulations primarily intended to govern new construction will be, in a measure, removed by the new requirements. The provision that an approved bath tub shall be installed in each suite of family apartments in every new brick building marks a distinct advance.

#### PLUMBING IN PUBLIC SCHOOLS.

The appropriation of \$25,000 for repairs to the plumbing in the public schools has resulted during this year in material increase in the work of this bureau, which has had charge, under general direction of the Engineer Commissioner, of the making of plans and the letting and execution of the contracts involved. The renovation of

plumbing done under this appropriation was mainly in the Central High, the Sumner, the Banneker, and the Grant schools.

A defective vitrified sewer was removed from the basement of the Central High School and a cast-iron line substituted. One basement toilet room was entirely refitted, and the defective system of waste pipes from the chemical laboratory replaced with exposed ones. Numerous necessary small fixtures were provided on various floors. At the Sumner School the objectionable and inadequate outside sanitariums were replaced with a two-story and cellar toilet building fully equipped with fixtures of advanced type and provided with satisfactory ventilation and steam heating apparatus. At the Banneker School a terra-cotta sewer was replaced with iron and toilet facilities of high grade introduced into basement rooms to replace the trough closets located in outside structures. During the summer an extensive contract involving the replacement of the thin metal urinals in fourteen buildings with an approved type of slate ventilated fixture was carried out.

In addition to the other work of planning and supervision there was prepared a set of 100 tracings showing the schoolhouse sites with the buildings located thereon, the sewer, water, and gas connections, and the surrounding pavements and inclosures.

The work proposed for the present year includes new toilet facilities at the Grant Building, a new rear building and iron sewers in the Force, and replacement of antiquated plumbing in the Gales and Garnet schools, as well as many repairs of minor nature and the installation of additional small fixtures.

#### PROSECUTIONS.

Warrants were sworn out in 24 cases involving violation of the plumbing laws, and in 11 of these cases brought to trial fines were imposed by the court, being in one instance only above \$10. Of the remaining cases, 1 unregistered plumber was not apprehended, 4 forfeited collateral rather than stand trial, 3 were found guilty and released on personal bonds, 3 were found not guilty, and 2 cases were nolle prossed on account of compliance before trial with the requirements made. It is regretted that heavier fines are not imposed in clear cases, as the difficulty of securing evidence and absolute identification is great, and the present low penalties do not appear to deter the convicted ones from again doing plumbing work in an improper manner, to the serious detriment of the community.

#### PUBLIC COMFORT STATION.

The improvements now in progress of the street space at the intersection of Seventh and O streets with Louisiana avenue NW., and the admitted necessity for public convenience buildings, suggest the desirability of using a portion of the area to be inclosed for the location of a public comfort station. A site at the point for such a structure would be an exceptionally convenient one, entirely under the jurisdiction of the Commissioners, and I recommend that an appropriation for this purpose be requested.

#### PERSONNEL.

A change in the personnel of the office occurred through the resignation on June 22 of John J. Ryan, inspector of gas fitting, and the appointment of William H. Marsh to the vacancy. The office force was temporarily increased by the detail of the corps of five hydrant inspectors, whose times of service were various, the maximum being about six months.

The promotion of one of the assistant inspectors from \$1,000 to \$1,200 was made possible by the provision of the appropriation act for the current year, and affords some recognition of the responsibilities borne by these men.

It is necessary, for the satisfactory making of the final tests of completed plumbing work and the giving of proper attention to the execution of plumbing in buildings owned by the District, that the field force be increased by provision for another inspector for the performance of these additional duties.

Very respectfully,

CHAS. B. BALL,  
*Inspector of Plumbing.*

Capt. LANSING H. BEACH,  
*Corps of Engineers, U. S. A.,*  
*Engineer Commissioner, District of Columbia.*  
(Through Captain Gaillard.)

## REPORT OF THE PLUMBING BOARD.

WASHINGTON, D. C., August 7, 1900.

CAPTAIN: I have the honor to submit the following statement of the second year's work of the plumbing board:

The meetings of the board were continued in accordance with law, and there were held during the year 41 sessions, 16 of which were devoted to the consideration of a revision of the plumbing and gas-fitting regulations, made in accordance with your direction, and now in the hands of the printer.

The order of August 1, 1899, substituted Thomas Humphrey, master plumber, and A. M. Lawson, an employee of the District, for Messrs. T. V. Noonan and C. F. Eckloff, respectively, whose terms of service expired. At a meeting held August 2, Mr. Quinter was chosen president of the board to succeed Mr. Noonan.

The total number of examinations conducted was 36. The number of original candidates examined was 12, only 2 of whom passed. Of those who had previously been examined, 11 were recommended for licensing and 13 failed.

The board for a considerable period has had under advisement the question of substitution of written examinations for the oral ones, so long in vogue, and it was determined on March 21 that examinations conducted on and after June 6 should be in writing. It is thought advisable to introduce, as a part of the examination, an actual demonstration of the candidate's skill as a plumber, and I have been instructed to request that the necessary appliances be provided and a room fitted up for the purpose.

Very respectfully,

JOS. R. QUINTER, *President.*  
CHAS. B. BALL, *Secretary.*

Capt. LANSING H. BEACH,  
*Corps of Engineers, U. S. A.,*  
*Engineer Commissioner, District of Columbia.*  
(Through Captain Gaillard.)

## REPORT OF THE INSPECTOR OF BUILDINGS.

WASHINGTON, July 30, 1900.

CAPTAIN: I have the honor to submit herewith the annual report covering the transactions of the building department for the fiscal year ending June 30, 1900, together with recommendations for the fiscal year ending June 30, 1902:

*Statement of permits issued from June 30, 1899, to July 1, 1900.*

Description.	Number.	Value.	Description.	Number.	Value.
Brick dwellings.....	519	\$2,305,510.00	Stables (brick).....	30	\$26,945.00
Frame dwellings.....	131	232,885.00	Stables (frame).....	48	11,171.00
Brick repairs.....	732	782,892.00	Workshop, etc.....	11	17,290.00
Frame repairs.....	433	78,569.50	Greenhouses.....	14	9,460.00
Stores (brick).....	20	64,375.00	Engine and boiler.....	33	31,190.00
Stores (frame).....	5	9,200.00	Bakery.....	1	5,000.00
Store and dwelling (brick)	10	38,130.00	Vault or underground		
Store and dwelling (frame)	1	2,200.00	construction.....	4	1,225.00
Apartment houses.....	58	852,258.00	Assembly hall (frame)...	1	1,700.00
Hotels.....	2	559,700.00	Grand stand.....	1	300.00
Office buildings.....	11	517,600.00	Freight depot (frame)...	1	625.00
Bank.....	1	100,000.00	Waiting room (frame)...	6	955.00
Library.....	1	300,000.00	Coal and wood yard.....	1	600.00
Orphan asylum.....	1	120,000.00	Sheds (brick).....	14	4,350.00
College.....	3	175,000.00	Sheds (frame).....	337	15,534.00
Convent.....	2	93,000.00	Minor repairs.....	2,240	20,160.00
School (frame).....	1	15,000.00	Awnings.....	132	9,900.00
Church (brick).....	6	98,255.00	Fire escapes.....	15	5,400.00
Church (frame).....	1	500.00	Elevators.....	29	58,775.00
Warehouse.....	4	215,700.00			
Factory.....	1	14,000.00	Total.....	4,861	6,795,354.50

Special applications for projections beyond the building line approved, 493.

# 70 OPERATIONS OF THE ENGINEER DEPARTMENT, D. C.

*Comparative statement for years 1899 and 1900.*

Year.	New build- ings.	Repairs.	Dwellings.
1899.....	1,056	1,499	913
1900.....	892	1,520	654
Increase or decrease.....	164	21	259

## Valuation of building operations:

1899.....	\$5,565,525.00
1900.....	6,795,354.00
Increase.....	1,229,829.00

## Number of permits issued, including buildings, repairs and minor repairs, awnings, vaults, etc.:

1899.....	3,309
1900.....	4,339
Increase.....	1,030

Inspections made and applications disapproved.....	22
Inspections made, applications approved, and permits uncalled for.....	54

The following summary will show the distribution of improvements in the different sections of the District, and the value of same:

	Buildings.	Repair.
Northwest.....	\$3,029,500.00	\$705,334.00
County.....	1,894,536.00	81,603.00
Northeast.....	524,668.00	25,991.00
Southeast.....	276,185.00	29,156.00
Southwest.....	101,906.00	31,149.00
Total.....	5,826,794.00	874,325.00

The following are the receipts of the office for the past year:

For building permits.....	\$3,194.00
For awnings.....	132.00
For vaults.....	4.00
For boilers, engines, ovens, and furnaces.....	37.00
Total.....	3,367.00
Received for year 1899.....	3,796.00
Decrease.....	429.00

In addition to the permits above enumerated, miscellaneous permits were issued, for which no fees were obtained, consisting of rebuilding entrance porches and steps, temporary structures for the use of builders in connection with new construction, extra occupancy of public space for building materials, and excavations for buildings.

The report of the assistants, hereunto attached, shows that the inspections made were as follows:

Visits to new buildings.....	6,729
Visits to old buildings in course of alteration or repair.....	2,516
Visits of a miscellaneous character.....	3,446
Total, 1900.....	12,691
Total, 1899.....	12,369
Increase.....	322
Condemnation of dangerous buildings or parts thereof—	
For 1900.....	616
For 1899.....	120
Increase.....	496

By reference to the tabulated statement of building operations for the past fiscal year it will be seen that, while the number of new buildings has fallen off slightly, the increase in value over last year has been \$1,250,000, showing that the structures erected have been of greater size and better character than formerly. The decrease in the number of dwellings erected and increase in apartment houses is noticeable, and worthy of some consideration by investors.

The steady increase in suburban buildings adds to the ever-increasing work of the office, by spreading the building operations over the entire District and covering a greater area than occupied by cities of twice or thrice our population. But I regret to say the office force has not increased with the expansion in all other directions, and in comparison with other cities our small force would appear entirely inadequate to the demands of the public welfare. I am convinced that the full scope and responsibility of the work are not understood by the public and appreciated by our legislators. When it is realized that from 500 to 600 buildings are under construction at one time, and spread over an area of 62 miles, it will be seen that our force of four inspectors, traveling from 12 to 15 miles a day, and allowing the insufficient time of twenty minutes for each inspection, could not visit each building once a week. I am sure that a whole story of a house can be constructed between visits, and the lives and property of the public jeopardized, and an unreasonable responsibility imposed on a bonded officer, who works in and out of office hours to avoid calamities. I have appealed in vain for a force sufficient to visit each building under construction at least once a day. It is not sufficient to give the office one additional man at a time, for it appears that every man has now six days' work to crowd into one day.

This office has no limit of hours for daily work, and, with rare exceptions, our assistants work overtime in their efforts to relieve the inspector of buildings of the constant apprehension that some frightful accident may occur, notwithstanding the fact that the utmost vigilance is exerted by our small force. I beg also to call attention to the fact that except in case of sickness or debility from overwork our employees never receive the usual rest or holiday accorded Government clerks. They have rarely received a week's vacation, and consequently often break down under the strain of incessant work.

The corps of assistant inspectors in the field should be increased by at least four additional men, and to afford them full time for the inspection of buildings and relieve them of the great amount of correspondence or clerical work now incident to such inspections an additional clerk should be provided for the office. There need be no fear of raising the force beyond the demands, for as the force increases their utility will be more and more evident in the improvement and safety of the buildings and the more expeditious methods of transacting work with this office.

Within the past year the builders and others interested in building have called attention to the time consumed in obtaining permits, but under present conditions the office can afford no relief. The assistant inspector whose duty it is to examine all plans for new buildings and repairs often has from ten to twenty applications to pass on in one day. These applications cover a wide range, from minor repairs to large buildings, besides the disposition of building materials on the streets, the revision of applications for projections beyond the building line, the assignment of house numbers, and the preparation of permits for engines, boilers, coal yards, awnings, fences, signs, and numerous things not strictly in the building line. He should be furnished an assistant to relieve him of the minor permits and give more time for a careful examination of the plans for buildings and revision of specifications and drawings for municipal buildings.

The increase in suburban building has added to the difficulty of house numbering, and under present conditions numbers can not be assigned with any certainty until the streets are designated by numbers beyond the boundary of the city. In order to avoid duplication of numbers and to improve the permit index, the card system was adopted in January, 1898. This system is based on the squares of the city by numbers, and each of the four streets bounding a square is given a card, with lot, square, and house number. Outside the city the same is done, with the subdivision substituted for the square. But to perfect the index and make it available for house numbering, all permits issued prior to 1898 should be included in this index, and there yet remain 43,000 permits not so indexed. A special appropriation will be required for this purpose.

The appropriations for the District buildings were not available until the 1st of July, and as the law requires that plans and specifications for all buildings provided for in the annual appropriation bill shall be prepared under the supervision of the inspector of buildings, the work of the office in supervising and correcting plans and specifications for District buildings has been extremely heavy, at the time of the year

when the building operations of the city are at their height. When several months are required in the preparation of plans, several weeks are necessary for the proper revision of them, and, necessarily, as there are 25 buildings provided for in this year's appropriation some must be postponed until next spring. I beg that the Commissioners will appreciate the fact that nine buildings have already been advertised or contracted for and the other buildings should be put upon the market at the rate of one every two weeks after receipt of plans and specifications.

The last edition of the building regulations is exhausted, and as copies are constantly applied for I would recommend the appointment of a commission to carefully revise our regulations. I am of the opinion that such a commission should be employed and compensated for their services, and besides architects, engineers, and builders, a lawyer should be appointed on such a board. I would recommend that the report of the assistant inspector of elevators be referred to such a board.

During the year two school buildings have been completed, namely, Hubbard and Girls' Reform School; one hospital on the grounds of Providence Hospital, and one building for addition to almshouse. The truck house in West Washington will be completed within three weeks.

I would recommend an amendment to the building regulations in regard to the size and quality of bricks. At present brick of all sizes and of doubtful quality are being used, and with the present terms of the regulations it is difficult to obtain work of the desired standard. Much has been done to improve the quality of brickwork, but in several instances Roman size brick, Pompeian brick, press brick, and common brick have been used in the inclosing and party walls of a building. There should be a limit of variation in the size of bricks used in the same wall or building, and formerly such a regulation was in force. This and many other improvements might be suggested to a commission for revision of the regulations.

I would also recommend that the regulations relating to the electrical wiring of buildings be removed from the building regulations and placed under the charge of the electrical engineer, District of Columbia.

I have the honor to submit herewith the detailed reports of the assistant inspectors.

In conclusion, I beg to acknowledge the kindness and courtesy extended to this office by you.

Very respectfully,

Capt. LANSING H. BEACH,  
*Corps of Engineers, U. S. A.,*  
*Engineer Commissioner, District of Columbia.*  
(Through Captain Gaillard.)

SNOWDEN ASHFORD,  
*Acting Inspector of Buildings.*

WASHINGTON, D. C., July 30, 1900.

SIR: We have the honor to submit statement of our official duties as assistant inspectors of buildings during the fiscal year ending June 30, 1900.

Visits to new buildings .....	6,729
Visits to old buildings in course of alteration or repair .....	2,516
Visits of a miscellaneous character .....	3,446
Total, 1900 .....	12,691
Total, 1899 .....	12,369
Increase .....	322
Condemnation of dangerous buildings or parts thereof—	
For 1900 .....	616
For 1899 .....	120
Increase .....	496

The increase in the number of visits made during the fiscal year ending June 30, 1900, although not as great as in the preceding year ending June 30, 1899, compares very favorably with former years, from the fact that some of your assistants were unable to bear up under the pressure and broke down from overwork, much valuable time being thus lost.

During the year we had one serious windstorm, on the 3d of August, 1899, business being blocked and roofs blown away. Immediately after the storm your assistants

were in the field ordering the repairs, reconstruction or removal of dangerous buildings and parts thereof, in the interest of public safety.

From September 21 to October 3, 1899, much attention had to be given to the safety of stands, balconies, roofs, etc., along the streets through which the several processions in connection with the Dewey reception passed. These important events passed off without accident or injury to life or limb.

As the city increases rapidly in size, and as its commercial interests increase day by day, the results of that progress can be seen in the city's buildings.

During the year many existing business establishments have been altered and increased in size, requiring the greatest care and judgement in their reconstruction, the work in many cases being of the most dangerous character.

The subject of foundations has required more than usual attention during the last twelve months, from the fact that many important buildings have been erected on bad ground, which has in some cases been filled for many feet in depth, and in other cases on swampy and treacherous ground, the loads per square foot of bearing surface varying from 1 to 8 tons. Twelve different systems of foundation construction were used, as follows:

- (1) Brick and cement.
- (2) Concrete.
- (3) Concrete in sheet-piling bunks.
- (4) Concrete with steel grillage.
- (5) Concrete with steel grillage in sheet-piling bunks.
- (6) Concrete with iron bars.
- (7) Concrete with expanded metal.
- (8) Concrete en masse.
- (9) Piles with grillage and concrete.
- (10) Piles with concrete heading and no grillage.
- (11) Steel caissons, concrete filled.
- (12) Wood caissons, concrete filled.

These foundations have varied from 3 feet to 45 feet below grade, the general character of original ground excavated being clay and sand with gravel. Water was rarely found less than 10 feet in depth, in many cases below this level, however, increasing in volume very rapidly and adding to the difficulties of construction.

It is a matter for congratulation that during the dangerous work of demolition of the larger buildings of the city, to make way for modern structures, few accidents have occurred and these of small moment.

The continued and increasing use of steel in the construction of our modern buildings requires increased vigilance on the part of the inspector under whose care a building is being erected. When it is considered that from 5,000 to 15,000 bolts have to be driven in one of these modern fireproof buildings, each rivet having a definite and clearly defined duty to perform, the necessity for careful and rigorous inspection is at once apparent.

During the year we have endeavored to keep up and raise the standard of brick masonry throughout the city. In many cases a marked improvement in the quality of the work is noticeable. Without good bricks good workmanship is impossible; with good bricks the bricklayer has every opportunity to turn out work of the highest order.

It has been necessary to renumber the buildings on entire blocks and in some instances entire sections of the city have had to be thus treated. Within the last year 505 renumbering notices have been sent out, largely increasing our duties.

That the multitudinous duties of a minor nature, such as complaints, etc., have taken up much valuable time that ought to be devoted entirely to the supervision of construction work is a matter for much regret.

Thanking you for your uniform courtesy and support at all times, we have the honor to remain, very respectfully,

C. W. SOMMERVILLE,  
RICH'D M. EVANS,  
HENRY STOREY,  
CHAS. A. HARKNESS,  
*Assistant Inspectors of Buildings.*

MR. JOHN B. BRADY,  
*Inspector of Buildings, District of Columbia.*

WASHINGTON, D. C., July 30, 1900.

SIR: I have the honor to report that during the fiscal year ending June 30, 1900, the following installations, inspections, and condemnations were made in accordance with the regulations governing the various departments thereof, and assigned to the duties of the inspector of elevators:

Elevators installed .....	29
Elevator condemnations during installation .....	7
Elevators inspected .....	912
Elevators condemned for repairs .....	285
Fire escapes erected .....	15
Fire-escape condemnations during erection .....	6
Steam boilers installed .....	26
Steam engines .....	3
Gas engines .....	5
Gasoline engines .....	1
Bake ovens .....	2
Hotels inspected under fire-escape law .....	155
Miscellaneous condemnations .....	53
Inspections of heating apparatus .....	126

For a better and more uniform method of construction and erection of elevators, I have the honor to recommend that section 198 of the "regulations governing elevators in the District of Columbia" be amended by striking out all matter of said section and inserting the following in lieu thereof, so as to make section 198 read as follows:

"SEC. 198. It shall be unlawful for any person or persons, company or corporation, to construct or erect, or cause to be constructed or erected, any elevator to be used for carrying passengers or freight, from one floor to another, in any building erected, or that may be in the course of erection, without making application for permission therefor to the inspector of buildings; and before the inspector of buildings shall grant permission for the erection, construction, or use of such elevators, there shall be filed in his office as a matter of record plans and specifications showing the type and make of machine, and motive power to be used, and the size of all ropes, sheaves, drums, and supporting beams; also speed, travel, and capacity of car, type of safeties, dimensions of pressure tank, and pressure carried thereon, or the number of volts and amperes of electric current or motor used.

"The inspector of buildings shall not grant the permission intended by this section for the erection of any elevator that may have less than two ropes of approved diameter, carrying the weight of the car and its load, or each counterbalance weight thereof."

Also, after the word "use," in the last line of section 200, insert the following: "The said certificate shall be placed under glass and framed and hung in a conspicuous place in the car of the elevator for which the certificate was issued."

And after the word "every" in the third line of section 202, the word "three" be stricken out and the word "six" be inserted in lieu thereof.

Also strike out all of section 207 except the schedule of sizes, and insert in lieu thereof the following:

"SEC. 207. It shall be unlawful for the owner or owners, in fee, or for life, of any building in the District of Columbia to maintain, or cause to be maintained, any elevator for carrying passengers in the said building, unless such elevator shall have at least two hoisting ropes attached thereto, and two ropes attached to any counterweight used in connection with the elevator. All ropes will be independently fastened at their terminals.

"All doors approaching elevator shafts shall have safety locks of approved make, so that said doors will be closed when the elevator car is not at the floor where said doors are located."

I deem it advisable to urge the adoption of the foregoing amendments, because the regulations now in operation are not sufficiently stringent to cover the erection and construction of elevators. This office has no record of the sizes of the ropes, types of safeties, etc., in relation to elevators now in use. Heretofore the construction has been so at variance, and very little time given to consider the carrying capacities of the car, the weights to be sustained, etc., that it has been practically impossible to get a uniform elevator service. I believe these amendments submitted will materially assist to facilitate the regular inspections.

The rapid increase in the number of elevators is making it practically impossible for one man to visit all of the plants once in three months and make the necessary critical inspections to insure the public safety.

There are several elevators now in use which have but one hoisting rope attached to the car, and as several opposite leads over small sheaves, which makes the ropes deteriorate very much faster than would otherwise be the case, and if section 207 be adopted it would give the inspector power to condemn such hoists and compel the owners to increase the number of ropes or change the position of the machinery.

During the year there has been at least one serious accident, caused through the failure to securely close the elevator door, and in this connection I submit the last paragraph of section 207, with the view of giving the inspector of buildings the authority to use his own judgment in placing a safety lock on such elevators as he deems advisable.

Many of the plants in the city are so situated that different persons can and do operate these elevators, as in the case where this accident occurred. There are devices in the form of alarm safety locks, which if applied to the elevator doors in buildings occupied as a small hotel, such as this building is, would make such accidents practically impossible.

I have prepared a new form of certificate for your consideration, and recommend its adoption in lieu of the form heretofore in use, and if adopted, I would further recommend that the regulations governing elevators in the District of Columbia be printed on the back thereof.

Thanking you for the many courtesies shown me during the past year, and wishing for the success of your office, I am,

Very respectfully,

A. M. LAWSON, *Inspector of Elevators.*

MR. JOHN B. BRADY,  
*Inspector of Buildings, District of Columbia.*

# OFFICE OF THE SUPERINTENDENT OF REPAIRS.

WASHINGTON, August 7, 1900.

CAPTAIN: I have the honor to submit the annual report of the repairs to municipal buildings for the fiscal year ending June 30, 1900.

Repairs to school buildings were as follows:

Name of school.	Amount expended.	Name of school.	Amount expended.
First division:		Fourth division:	
Thomson .....	\$63. 25	Greenleaf .....	\$96. 50
Franklin .....	1,767. 00	Potomac .....	114. 00
Phelps .....	47. 50	Smallwood .....	249. 75
Dennison .....	900. 00	Amidon .....	449. 00
Force .....	623. 50	Bradley .....	106. 50
Adams .....	419. 25	Jefferson .....	1,056. 70
Harrison .....	247. 00		
Berret .....	650. 00	Total .....	2,072. 45
Total .....	4,717. 50		
Second division:		Fifth division:	
Seaton .....	670. 00	Grant .....	797. 57
Polk .....	284. 25	Fillmore .....	316. 00
Abbot .....	285. 75	Curtis .....	974. 00
Henry .....	1,628. 37	Threlkeld .....	482. 50
Eckington .....	195. 00	Corcoran .....	415. 00
Webster .....	948. 50	Addison .....	1,330. 00
Twining .....	242. 50	Jackson .....	136. 75
Morse .....	427. 92	Weightman .....	284. 00
Total .....	4,682. 29	High Street .....	117. 50
		Toner .....	51. 25
Third division:		Total .....	4,904. 00
Hilton .....	189. 84	Sixth division:	
Maury .....	620. 49	Arthur .....	730. 00
Wallach .....	376. 72	Blake .....	336. 10
Brent .....	235. 25	Hayes .....	1,168. 50
Carbery .....	86. 50	Blair .....	139. 61
Lenox .....	399. 50	Madison .....	306. 35
Towers .....	538. 50	Pierce .....	173. 00
Peabody .....	559. 40	Taylor .....	236. 25
McCormack .....	156. 00	Hamilton .....	355. 80
Total .....	3,162. 20	Langdon .....	51. 01
		Gales .....	739. 00
		Total .....	4,235. 71

Name of school.	Amount expended.	Name of school.	Amount expended.
Seventh division:		Ninth division—Continued.	
Reservoir.....	\$92.00	Phillips.....	\$266.80
Chain Bridge.....	33.00	Wormley.....	455.00
Conduit Road.....	97.00	Magruder.....	111.50
Tenley.....	119.00	Stevens.....	176.50
Chevy Chase.....	189.00	Garrison.....	147.05
Grant Road.....	154.00	Total.....	2,136.67
Brightwood.....	118.00	Tenth division:	
Military Road.....	34.00	Cook.....	426.50
Johnson.....	616.50	Garnet.....	162.00
Wilson.....	80.50	Patterson.....	220.00
Mott.....	168.25	Slater.....	136.75
Bruce.....	10.30	Bannaker.....	364.70
Fort Slocum.....	40.00	Jones.....	311.50
Woodburn.....	231.00	Douglas.....	103.00
Brookland.....	135.50	Logan.....	122.00
Ivy City.....	30.00	Total.....	1,846.45
Monroe.....	216.75	Eleventh division:	
Total.....	2,447.50	Lincoln.....	384.50
Eighth division:		Randall.....	90.00
Tyler.....	337.25	Bell.....	189.20
Buchanan.....	99.75	Giddings.....	407.70
Cranch.....	184.00	Anthony Bowen.....	87.00
Van Buren.....	308.30	Ambush.....	61.00
Van Buren Annex.....	247.00	Payne.....	263.00
Congress Heights.....	146.00	Miner.....	57.00
Garfield.....	444.00	Total.....	1,539.40
Good Hope.....	87.00	High schools:	
Hillsdale.....	12.00	Central.....	2,631.50
Birney.....	15.00	Western.....	910.20
Burrville.....	58.50	Eastern.....	1,453.36
Benning.....	16.00	Business.....	134.75
Benning Road.....	140.00	Colored.....	229.05
Total.....	2,095.60	Total.....	5,388.86
Ninth division:			
Briggs.....	352.50		
Sumner.....	527.32		

## SUMMARY.

Total accounted for.....	\$39,228.63
Stock on hand.....	3,000.00
Extra and emergency work.....	7,689.77
Forage for horse.....	81.60
Grand total.....	50,000.00

(Appropriation for school repairs 1900.)

Repairs have been made on 113 schools, city and suburban, together with 4 manual training schools. Material obtained on requisition is delivered either at the schools direct, or the repair shop, where it is then distributed; the same consisting of paints, oils, cement, brick, fire clay, sand, lumber, and hardware of all descriptions.

Repairs to the buildings consisted of practically all kinds of mechanical work, such as steam fitting, brickwork, paving, painting, tinning, carpentering, calcimining, grading, plastering, whitewashing, ironwork, graining, and overhauling of gas engines, hydraulic pumps, and batteries.

The school buildings at present are in an excellent condition without exception, and may be compared favorably with the buildings of any other large city of the country.

## POLICE STATIONS.

There are nine police stations in the district. Repairs to the amount of \$3,000 were made on these during the fiscal year ending June 30, 1900. Said repairs consisted mainly of painting, carpentering, furnace, and brickwork, tinning and roofing, plumbing, sewer work, iron work, whitewashing, calcimining and plastering.

## ENGINE HOUSES.

Repairs were made on twenty engine and truck houses at a cost of \$4,500 during the year. Included in these repairs were new granolithic floors for engine rooms, new stalls for horses, painting, glazing, whitewashing, tinning, roofing, plumbing, and sewer repairs.

MISCELLANEOUS.

In addition to the buildings enumerated above, construction work and repairs have been made, amounting to more than \$8,000, on the following buildings:

New boiler house at Industrial Home School, blacksmith shop at District of Columbia stables, repairs to smallpox hospital, stable at smallpox hospital, detention camp, disinfecting plant, dog pound, cat hospital, District of Columbia building, District of Columbia property yards, police court, and the Eastern, Western, and Georgetown markets.

Considering the number of buildings on which repairs are made at present, and the fact that there is a daily increase, it is suggested that a larger shop may be furnished. With the present quarters only a limited amount of material can be handled and consequently the work is considerably hampered. If a more suitable place could be secured, the introduction of a saw table, lathe, and machinery could be made, facilitating the work of repairs and reducing the cost of labor materially.

Respectfully,

L. E. BOND,  
*Superintendent of Repairs.*

Capt. LANSING H. BEACH,  
*Corps of Engineers, U. S. A.,*  
*Engineer Commissioner District of Columbia.*  
(Through Captain Gaillard.)

SECOND DIVISION.

Capt. H. C. NEWCOMER,

*Corps of Engineers, United States Army, Assistant to the Engineer Commissioner.*

STREETS, PAVEMENTS, GRADES, AND CONSTRUCTION OF ROADS.....	CONWAY B. HUNT, <i>Computing Engineer.</i>
SIDEWALKS AND ALLEYS.....	H. N. MOSS, <i>Superintendent of Streets.</i>
MAINTENANCE OF COUNTY ROADS.....	GEORGE N. BEALE, <i>Superintendent of Roads.</i>
CONSTRUCTION AND CARE OF BRIDGES.....	GEORGE H. BAILEY, <i>Engineer of Bridges.</i>
SURVEYOR'S OFFICE.....	H. B. LOOKER, <i>Surveyor, District of Columbia.</i>
PARKING COMMISSION.....	TRUMAN LANHAM, <i>Superintendent of Parking.</i>

REPORT OF ASSISTANT IN CHARGE.

OFFICE OF THE ENGINEER COMMISSIONER

DISTRICT OF COLUMBIA,  
Washington, September 14, 1900.

CAPTAIN: I have the honor to transmit herewith annual reports giving in detail the operations, during the fiscal year ending June 30, 1900, of the surface division, the surveyor's office, and the parking commission, viz:

Report of the computing engineer, including reports of the superintendent of streets, superintendent of roads, and the engineer of bridges.

Report of the surveyor, District of Columbia.

Report of the superintendent of parking.

Very respectfully,

H. C. NEWCOMER,  
*Captain, Corps of Engineers, U. S. A.,*  
*Assistant to Engineer Commissioner District of Columbia.*

Capt. LANSING H. BEACH,  
*Corps of Engineers, U. S. A.,*  
*Engineer Commissioner District of Columbia.*

## REPORT OF THE COMPUTING ENGINEER.

WASHINGTON, D. C., July 1, 1900.

CAPTAIN: I have the honor to submit the following report of operations of the surface division of the engineer department of the District of Columbia for the fiscal year ended June 30, 1900:

*Summary statement of work under appropriations for "Improvement and repairs" and "Construction of county roads and suburban streets."*

	Improvement and repairs.	County roads and suburban streets.	Total.
Asphalt, 6-inch base.....square yards..	29,339.20	21,807.91	51,147.11
Vitrified block gutters.....do.....	4,896.43	2,590.64	7,487.07
Asphalt block.....do.....	20,296.10	11,641.37	31,937.47
Granite and traps.....do.....	3,867.38	5,971.49	9,838.87
Ordinary grading.....cubic yards..	17,756.89	96,093.00	113,849.89
Macadam grading.....do.....	4,580.60	2,809.00	7,389.60
Old cobble removed.....square yards..	16,357.55	2,248.00	18,605.55
Old curb removed.....linear feet..	13,727.90	357.00	14,084.90
Curb set.....do.....	22,688.81	6,853.00	29,541.81
Curb reset.....do.....	8,749.80	6,391.96	15,141.76

Included in the above, 1,199.48 square yards asphalt and 202.47 square yards vitrified block gutters, laid on E street NW., between Thirteenth and Fourteenth, in place of asphalt block, the cost of which was paid from repairs to concrete pavements.

29,789 square yards asphalt and 3,817 square yards vitrified block gutters resurfaced over coal tar pavements, which are now classed as asphalt, not included in the above statement.

In the report of the superintendent of streets all day-labor work under the appropriation for "Repairs to streets" is consolidated. It seems proper to segregate certain items of work, which are accordingly itemized as follows: The roadway of Fifteenth street NE. between G and H was regulated and the crown reduced; extensive repairs were made to the asphalt-block roadways of D street SE. between Second and Third, Fourth street SE. between Pennsylvania avenue and C street, Seventh street between North Carolina avenue and East Capitol street, and at the intersection of First and C streets SE.; the roadways of F street NE. between Thirteenth and Fourteenth and of Fourteenth street NE. between E and F streets were macadamized and guttered, as was also the roadway of Bates street NW. The roadway of Seventeenth street NW. from B to E was extensively repaired, using old bituminous base as material; the roadway of E street NE. between Fourth and Fifth was repaired with macadam and vitrified-block gutters were laid, and the roadway of Pierce street NW. between Fourteenth and Fifteenth was narrowed and resurfaced.

The principal items of work under the appropriation for "Repairs to roads" were the changing of the grade of the causeway of the Bennings road; the guttering and regulating of the roadway of Flint street in Brightwood Park; the grading of Concord street from Tenth to Thirteenth in Brookland; the guttering and regulating of Whitney avenue from Brightwood avenue to Sherman avenue; the general regulating of Nichols avenue southward from Sheridan avenue; the grading and regulating of the Grant road between Wisconsin avenue and Albemarle street; and the widening and macadamizing of Brightwood avenue from Rock Creek Church road to the District line.

The following is a list of the tables appended to this report:

- Table A.—Street railways in the District of Columbia, July 1, 1900.  
 B.—Statement of character and extent of street pavements, July 1, 1900.  
 C.—Statement of mileage of street pavements, July 1, 1900.  
 D.—Descriptive list of street pavements, giving character, extent, cost, etc.  
 E.—Schedule of work on streets and avenues and county roads and suburban streets.  
 F.—Repairs to asphalt and concrete pavements for year ended June 30, 1900.  
 G.—Work done at cost of railroad companies.  
 H.—Work done by day labor under appropriation for "Current repairs to streets, avenues, and alleys."  
 I.—Regular permit work.  
 K.—Assessment work.

Table L.—Replacing and repairing sidewalks and curbs around public reservations.  
 M.—Miscellaneous work.  
 N.—Whole cost work.  
 O.—Repairs to cuts by plumbers and others.

Most of the streets resurfaced were originally coal-tar pavements, which are henceforth considered as asphalt pavements.

All pavements marked in the tables as laid by Thomas H. Thomas and the Eastern Bermudez Asphalt Paving Company were paved with Bermudez asphalt.

As an incident to the expenditure, by contract, of the bulk of the appropriation for "Improvement and repairs," "Repairs to concrete pavements," and "Construction of county roads," and on account of other appropriations not under the control of the surface division, there were executed miscellaneous items of work by day labor during the year, as shown in detail in Table M. This work amounted to \$57,145.04.

The reports of the superintendent of streets, superintendent of roads, and engineer of bridges are transmitted herewith.

The District quarry was operated successfully throughout the year. On account of the urgent need of quick deliveries on Brightwood avenue a supplemental arrangement was made for the purchase of a quantity of limestone, which was principally used in the bottom layers of the roadway. The reconstruction of the electric railway on Brightwood avenue from Florida avenue to the District line afforded an occasion and opportunity to relocate the tracks of this road. The location as originally made had been recognized as defective, and had operated as an obstacle to the development of the avenue. The new location conforms to the center line of the roadway between curbs from Florida avenue to the Rock Creek Church road, and to the center line of the avenue beyond that point to the District line. In connection with this relocation of the railroad the efforts of the office were persistently directed to removing all fences, steps, etc., that encroached beyond the lines of a 66-foot right of way. The cobble gutters were relaid, telegraph poles, lamp-posts, etc., moved, and the roadway between the tracks and the gutters was macadamized. The railroad company was required to expend about \$11,000 toward this macadamizing, for the reason that the new location of their tracks in the center of the road destroyed a large area of macadam construction which the District had originally paid for and which the railroad company was required to replace.

The status of Brightwood avenue, especially beyond Brightwood, has been greatly modified and its condition improved as a result of the large expenditures and of the policy pursued during the past year.

In connection with the construction of the extension of the Columbia Railroad along the Bennings road a profile for this road was adopted which necessitated the raising of the level of the causeway and bridge approach across the flats just west of the Bennings Bridge over the Eastern Branch. This change in the road's profile was made by the labor of the chain gang, supplemented by expenditures from the appropriations for "Repairs to roads" and "Repairs to bridges," and the new surface of the road was macadamized with trap rock. The improvement was a radical one, and comports with the work done on the same road between Fifteenth street and the Cool Spring road under provision of a special appropriation in the annual appropriation bill. Under this last a novel type of roadway construction was adopted. This consisted in paving a strip of standard sheet asphalt along the center of the road 10 feet wide and flanking it on either side with granite blocks paved on a gravel base. The granite blocks were those removed from other city streets from time to time, and the cost of the construction was so moderate that the limits of the improvement could be extended far beyond what would have been possible had it not been followed. The details of the cost are given in the tables. The results have been so satisfactory as to indicate that this type of construction should be extended to the principal county thoroughfares as rapidly as appropriations can be secured. The advantages in economy of maintenance will be such as to justify liberal provision for enlarging the use of this type of improvement.

The grading and improvement of the Adams Mill road entrance to the Zoological Park was contemplated during the year and bids therefor were received, but Congress having reappropriated the funds for the work, together with provision for widening the road, a postponement of active operations was necessitated in order that the new roadway construction might be properly located in relation to the new street lines.

Under the appropriation for the construction of the Massachusetts avenue bridge detail plans were prepared and approved by the Chief of Engineers, United States Army, as required by law, and a contract for the masonry structure was executed with the Brennan Construction Company. Operations under this contract, as well as under the existing contract with the Cranford Paving Company for the bridge foundations, are temporarily suspended, awaiting the condemnation of a portion of the bridge site.

The equipment of the lines of the Anacostia and Potomac River Railway as an underground electric construction occasioned a large amount of work on the part of this division during the year. Not only does this class of work require careful and detail study of line and grade before operations are begun, but constant care and supervision during its progress, as well as a large amount of repaving work at the cost of the railway company. It is believed that this work during the past year has been planned and conducted in such manner as to leave no occasion for future criticism as to its precision of location or quality.

During the year reports were formulated on pending legislation looking to the removal of grade crossings along the lines of the Baltimore and Potomac and the Baltimore and Ohio Railroad companies, and it is worthy of record that the Senate passed bills for these purposes embodying plans in each case practically as proposed by this office.

During the year four county-road grade crossings were dispensed with as a result of work done by the Baltimore and Potomac Railroad Company in constructing a new road parallel to and east of their tracks from the Sheriff road to the Anacostia road, the crossings to these two roads over the Baltimore and Potomac main-line tracks and the Shepherd's branch of the Baltimore and Ohio Railroad being replaced by a new subway near the Sheriff road at the point where the Columbia electric-railway extension passes under these steam-railroad tracks.

The current routine work of the office has been kept up to date during the year, and my acknowledgments are due to the force engaged for the results accomplished.

Respectfully submitted.

C. B. HUNT,

*Computing Engineer, District of Columbia.*

Capt. LANSING H. BEACH,

*Corps of Engineers, U. S. A.,*

*Engineer Commissioner, District of Columbia.*

(Through Captain Newcomer.)

#### REPORT OF THE SUPERINTENDENT OF STREETS.

WASHINGTON, D. C., July 1, 1900.

CAPTAIN: I have the honor to submit herewith the annual report of the operations under my charge for the fiscal year ended June 30, 1900.

Table H is a summary of work done (by day labor, except cement sidewalks) under the appropriation for "Current repairs to streets, avenues, and alleys." The cost of this work was \$16,132.52. Of this amount about one-half was sidewalk and alley work, and the other half repairs to street roadways.

During the year there were 2,134 dangerous holes repaired, aggregating 15,230 square yards, at a total cost of \$7,126.50.

Table I is a list of work done under the permit system, by which the property owners requested the improvements and paid one-half the cost, the District paying the other half. Total, \$20,786.57.

Under the act of Congress of August 7, 1894, the Commissioners of the District of Columbia are empowered, whenever in their judgment the public health, safety, or comfort requires it, to improve and repair alleys and sidewalks and pay the total cost out of the appropriation for "Assessment and permit work." One-half the cost of the work ordered under the assessment system is charged against the abutting property, and becomes a lien upon said property. Total cost of such work was \$154,348.87. (See Table K.)

Table L is a list of the work done out of the appropriation for "Replacing and repairing sidewalks and curbs around public reservations and municipal buildings." The amount expended under this head was \$15,197.13. This includes the cost of some material purchased out of this appropriation for previous years.

Table M is a list of work done under various appropriations not under my charge. Total amount of such work was \$57,145.04.

Table N is a list of work done in public space for private parties, for their sole benefit and use, for which they pay the entire cost. Deposit to cover the estimated cost of the work is required in advance of the work being done. This work amounted to \$737.54.

H. N. MOSS,

*Superintendent of Streets.*

Capt. LANSING H. BEACH,

*Corps of Engineers, U. S. A.,*

*Engineer Commissioner, District of Columbia.*

(Through Captain Newcomer.)

TABLE A.—Street railroads in operation in the District of Columbia July 1, 1900.

Name of company.	Tracks in use, owned by company.			
	Underground electric.		Overhead electric.	
	Double.	Single.	Double.	Single.
Washington Traction and Electric Co.:	<i>Miles.</i>	<i>Miles.</i>	<i>Miles.</i>	<i>Miles.</i>
Metropolitan Railroad.....	9.31	3.98	.....	.....
Columbia Railway.....	2.77	.....	4.12	.....
City and Suburban Rwy. of Washington.....	4.06	2.36	5.58	.....
Brightwood Rwy.....	.....	.....	5.93	.....
Georgetown and Tennallytown Rwy.....	.....	.....	4.16	.....
Anacostia and Potomac River R. R.....	6.52	.....	1.46	1.64
Washington and Great Falls Electric Rwy.....	.....	.....	3.88	.....
Washington and Glen Echo R. R.....	.....	.....	10	.....
Capital Traction.....	12.76	10	3.57	.....
Baltimore and Washington Transit.....	.....	.....	.....	.43
Washington, Alexandria and Mount Vernon Electric Rwy.....	.90	.33	.....	.....
Total.....	36.32	6.77	28.80	2.07

TABLE B.

Locality.	Asphalt.	Coal tar and concrete.	Asphalt block.	Vitrified block.	Granite.	Cobble.	Macadam.	Gravel and unimproved.	Total.
	<i>Sq. yds.</i>	<i>Sq. yds.</i>	<i>Sq. yds.</i>	<i>Sq. yds.</i>	<i>Sq. yds.</i>	<i>Sq. yds.</i>	<i>Sq. yds.</i>	<i>Sq. yds.</i>	<i>Sq. yds.</i>
Northwest.....	1,609,171	228,990	30,600	13,903	168,743	115,394	58,807	168,317	2,393,925
Southwest.....	145,167	5,110	30,504	2,943	233,973	74,723	33,713	169,474	695,607
Southeast.....	138,910	0	159,572	0	56,845	31,293	100,004	471,781	958,405
Northeast.....	211,949	8,394	140,890	0	19,111	1,738	62,828	499,550	944,460
Georgetown.....	110,818	26,437	10,354	0	60,363	25,187	14,837	42,958	290,954
Suburban.....	241,543	0	18,722	0	32,252	0	491,574	.....	784,091
Total.....	2,457,558	268,931	390,642	16,846	571,287	248,335	761,763	1,352,080	6,067,442

33,606 square yards coal-tar pavement resurfaced with asphalt during the year and now considered asphalt.

TABLE C.—Statement showing mileage of street pavements July 1, 1900.

Locality.	Asphalt.		Coal tar and concrete.		Asphalt block.		Vitrified block.		Granite.	
	Linear feet.	Miles.	Linear feet.	Miles.	Linear feet.	Miles.	Linear feet.	Miles.	Linear feet.	Miles.
Northwest.....	349,887	66.27	53,913	10.21	8,580	1.63	2,250	0.42	43,728	8.28
Southwest.....	37,332	7.07	1,320	.25	8,187	1.55	500	.10	55,716	10.55
Southeast.....	36,379	6.90	0	0	38,128	7.22	0	0	15,406	2.92
Northeast.....	56,041	10.61	2,090	.40	28,235	5.35	0	0	4,700	.89
Georgetown.....	30,807	5.83	7,410	1.40	3,038	.58	0	0	17,271	3.27
Suburban.....	61,730	11.70	0	0	5,613	1.06	0	0	9,376	1.78
Total.....	572,176	108.38	64,733	12.26	91,781	17.39	2,750	.52	146,197	27.69

Locality.	Cobble.		Macadam.		Gravel and unimproved.		Total.	
	Linear feet.	Miles.	Linear feet.	Miles.	Linear feet.	Miles.	Linear feet.	Miles.
Northwest.....	21,309	4.00	11,418	2.16	49,542	9.38	540,627	102.35
Southwest.....	16,294	3.09	7,620	1.45	47,805	9.05	174,774	33.11
Southeast.....	10,366	1.96	27,146	5.14	117,827	22.31	245,252	46.45
Northeast.....	750	.14	14,264	2.70	130,744	24.76	236,824	44.85
Georgetown.....	9,631	1.82	4,200	.80	12,489	2.17	84,796	15.87
Suburban.....	0	0	116,926	22.15	.....	.....	193,645	36.69
Total.....	58,350	11.01	131,574	24.40	358,357	67.67	1,475,918	279.32

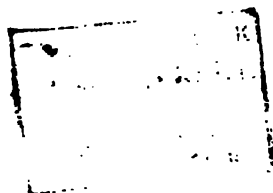
TABLE D—Continued.—Asphalt-block pavements in the District of Columbia, July 1, 1900.

Street.	From—	To—	Square yards.	Year laid.	Price.	Cost.	Contractor.	Remarks.
A, NE.....	Seventh.....	Ninth.....	2,300	1890	\$2.00	\$5,275.70	Patrick Maloney.....	In place of granite.
A, SE.....	Sixth.....	Seventh.....	2,390.85	1887	1.984	5,994.82	do.....	
A, SW.....	Third.....	Sixth.....	3,317.21	1886	2.10	7,918.95	Washington Asphalt Block and Tile Co.....	
A, SE.....	Seventh.....	North Carolina avenue.....	3,043.07	1894	2.00	8,182.45	do.....	
B, NW.....	First.....	Delaware avenue.....	4,412.85	1899	1.77	9,316.26	do.....	P. Maloney.....
B, SE.....	Eleventh.....	North Carolina avenue.....	4,577.53	1891	2.00	15,475.22	do.....	
C, NE.....	Fourth.....	Sixth.....	4,478.23	1886	2.00	12,493.13	do.....	
C, NE.....	Sixth.....	Eighth.....	3,986.09	1888	2.00	9,895.42	do.....	
C, NE.....	Eighth.....	Tenth.....	2,180.44	1891	2.00	7,244.69	do.....	Maloney & Knight.....
C, SW.....	Ninth.....	Twelfth.....	3,253.11	1885	2.10	7,679.93	do.....	
C, SE.....	New Jersey avenue.....	Fourth.....	6,922.32	1884	2.10	17,212.57	do.....	
C, SW.....	Twelfth.....	Fourteenth.....	3,839.57	1885	2.10	7,679.93	P. Maloney.....	
C, SE (north side).....	Fourth.....	Sixth.....	1,463.64	1890	2.00	3,496.49	do.....	Resurfaced with asphalt in 1889.
C, SE (south side).....	Fourth.....	Sixth.....	1,613.50	1891	2.00	3,814.05	do.....	
C, SE.....	Sixth.....	Seventh.....	2,141.67	1890	2.00	5,878.07	do.....	
D, NW.....	Fifth.....	Sixth.....	327.78	.....	.....	.....	do.....	
D, SE.....	First.....	Third.....	4,393.58	1889	2.00	11,251.93	P. Maloney.....	Resurfaced with asphalt in 1889.
D, SE.....	Third.....	Sixth.....	3,859.57	1890	2.00	9,978.56	do.....	
D, SE.....	Seventh.....	Ninth.....	1,205.12	1889	2.00	2,906.59	do.....	
D, SE.....	Ninth.....	Pennsylvania avenue.....	1,951.42	1892	2.00	6,167.89	do.....	
D, SW.....	Seventh.....	Ninth.....	2,064.07	1896	1.84	4,469.30	Washington Asphalt Block and Tile Co.....	do.....
D, SE.....	Sixth.....	Seventh.....	1,797.91	1897	1.77	3,688.50	do.....	
D, SE (completion).....	Sixth.....	Seventh.....	323.23	1900	1.77	7,743.89	do.....	
E, NE.....	First.....	Fourth.....	5,940.27	1893	2.00	16,003.96	do.....	
G, SE.....	South Capitol.....	Third.....	2,216.48	1896	1.78	4,871.51	do.....	do.....
F, SE.....	South Capitol.....	Third.....	6,603	1896	1.841	3,965.49	do.....	
F, SE.....	Third.....	Fourth.....	890.77	1899	1.77	2,200.39	do.....	
F, SW.....	Seventh.....	Tenth.....	3,972.78	1896	1.77	8,688.50	do.....	
F, SE.....	First.....	Second.....	2,405.08	1900	1.77	4,972.04	do.....	Resurfaced with asphalt in 1887, \$2,736.14.
G, SE.....	Eleventh.....	Pennsylvania avenue.....	1,730.24	1891	2.00	8,084.55	P. Maloney.....	
H, NW.....	Vermont avenue.....	Connecticut avenue.....	2,888.93	1881	1.76	7,651.03	John Cudmore.....	
I, SW.....	Third.....	Sixth.....	4,850.13	1896	1.77	10,492.93	Washington Asphalt Block and Tile Co.....	



TABLE D—Continued.—Asphalt-block pavements in the District of Columbia, July 1, 1900—Continued.

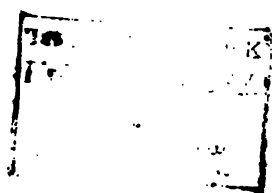
Street.	From—	To—	Square yards.	Year laid.	Price.	Cost.	Contractor.	Remarks.
Tenth, SE.	D	Pennsylvania avenue.	788.12	1891	\$2.00	\$2,488.99	P. Maloney	
Tenth, SE.	Pennsylvania avenue.	I	4,478.38	1896	1.84	11,448.81	do	
Tenth, SE.	Pennsylvania avenue.	I	449	1897	1.80	1,017.24	Washington Asphalt Block and Tile Co.	
Tenth, NE.	East Capitol	C	4,207.82	1897	1.77	10,971.97	do	
Eleventh, SE.	East Capitol	C	8,076.09	1891	2.00	23,775.77	P. Maloney	
Eleventh, SE.	C	Pennsylvania avenue.	7,065.85	1893	2.00	19,522.77	Washington Asphalt Block and Tile Co.	
Eleventh, NE.	East Capitol	Massachusetts avenue.	1,092.90	1895	1.84	2,500.04	do	
Eleventh, NE.	Massachusetts avenue.	C	4,202.27	1900	1.77	9,411.75	do	
Thirteen-and-a-half, SW.	B	D	3,016.31	1895	1.84	6,635.03	do	
Fifteenth, NW.	Pennsylvania avenue.	B	7,012.10	1883	2.19	15,911.25	P. Maloney	Resurfaced with asphalt in 1894.
Eighteenth, NW.	K	L	1,430.80	1886	2.10	3,285.68	do	
Twenty-third, NW.	K	M	2,386.81	1886	2.10	5,426.99	do	
Twenty-ninth, NW.	N	P	2,966.06	1883	2.19	6,495.10	do	
Thirty-first, NW.	N	P	2,957.30	1882	1.81	5,607.73	do	
Mass. avenue NE.	Sixth.	Eighth.	6,749.41	1889	2.00	16,444.36	do	
Mass. avenue NE.	First.	Second.	3,960.59	1893	2.00	11,683.74	Washington Asphalt Block and Tile Co.	
Mass. avenue NE.	Eighth.	Eleventh.	6,398.35	1895	1.84	13,677.36	do	
Maryland avenue NE.	First.	Fourth.	11,595.46	1887	2.00	26,941.96	P. Maloney	Resurfaced with asphalt in 1892 and 1896.
Maryland avenue NE.	Sixth.	Eleventh.	14,960.80	1889	2.00	35,633.96	do	Resurfaced with asphalt in 1894.
Maryland avenue NE.	Eleventh.	Thirteenth.	8,268.53	1890	2.00	22,965.91	do	
Maryland avenue NE.	Thirteenth.	Fifteenth.	9,635.10	1891	2.00	24,839.83	do	
Missouri avenue NW.	Four-and-a-half.	Sixth.	1,371.22	1894	2.00	4,745.17	Washington Asphalt Block and Tile Co.	
N. C. avenue.	D	F	3,111.49	1900	1.77	7,887.91	do	
N. C. avenue.	Third.	Sixth.	5,032.66	1890	2.00	12,480.60	P. Maloney	
N. G. avenue.	Sixth.	Eighth.	6,377.84	1891	2.00	16,714.70	do	
N. G. avenue.	Eighth.	Eleventh.	6,478.79	1892	2.00	18,185.64	do	
S. C. avenue.	Second.	Fourth.	3,903.46	1900	1.77	9,685.60	Washington Asphalt Block and Tile Co.	



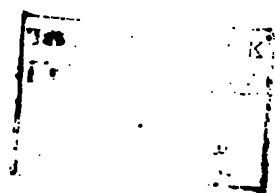
-Continued.

of laying.

17.	18.
.009	.019
.019	.007
.025	.048
.053	
0	0
.035	.037
.065	.008
.02	0
.021	
.02	
0	.006
.03	.003
.25	.02
.010	.002
.162	
.022	
.032	.004
.058	.049
.01	.042
.018	.01
.005	.017
.032	
.002	.011





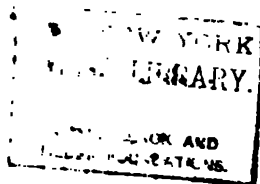


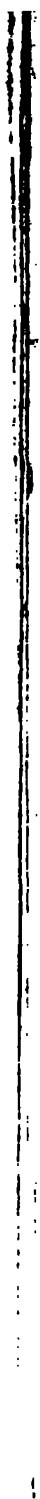


Continued.

of laying.

17.	18.
.01	.001
.031	.007
0	.008
.006	.039
.056	
.024	
.014	
.012	
.004	.003
.026	.009
0	.040
.001	.13
.012	
0	.033
.126	.069
0	0
.04	
.281	0
.004	.045
.141	.061
.07	.041
.001	.006
.012	.044
.022	.03





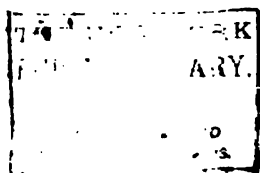
repairs.

Date of laying.

15.	17.	18
032	.014	.0
004		
05	0	*1.4
02		
016	.03	.0
12	.02	.0
035	.022	.0
053	.006	.0
0	0	0
0	.007	0
007	0	.0
03	.044	.0
0	0	0
038	.025	.0
159	.062	
025	.007	
043		
0	.022	
024		
006	0	0
02	.034	
024	.015	.1
0	0	.0
028	.021	.0
07		
004	.036	.0
005	.033	0
001	.063	
068	.06	
08		
008	.026	.01
03	.067	.01
035	.015	.01
015	.05	.06

THE NEW YORK  
PUBLIC LIBRARY  
ASTOR LENOX TILDEN FOUNDATION  
1900





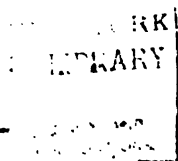


1. 3

# *h distributed cos*

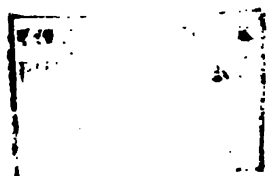
repairs per square yard

	13.	14.	
27	.06		
14	.048	.104	
01	.012	.019	
11	.02	.147	
1	*1.80		
23	*.206	*.215	
22	.036	*1.298	
02	.108		
22	.07	.038	
045	.02	*.135	
1			
16	.10		
14	.014	.066	
08	.014	.015	*
86	0	0	
0	*.562	0	
25	0	0	
05	.046	.013	
27	.05		
09	.0033	0	
057	.019	0	
56	.022	.033	
	0	.003	
	0	0	
41	.072	.073	
07	.131	.024	
07	.012	.03	
0	.035	.039	
	0		
	0	0	
	0	0	
065	.008	.026	
	0		
029	0	.0035	
21	.001	.011	
006	.0007	0	
07	.028	.01	
62	.015	.1228	
	.0009	0	
4	0	.06	
8	.10		
06	.002	.008	
288	.059	.08	
71	0		





031	.012	.02
07	.037	.08
0	0	0
005		
0	0	0
095	.134	*.74
65	0	*1.31
006	.016	.00
001	.036	.03
0	0	*1.40
019		
12		
027		
01		
0	.01	0
171		
0	.044	.03
029	.04	.11

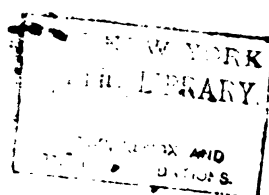


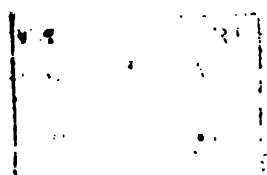
h base, with distrib

repairs per square yard pe

	13.	14.	15.
7	.013		
	.019		
9	.0066	.0083	.02
46	.0145	.038	.0152
8	.009		
	0		
6	.0345	.074	.032
	.032	.031	.022
26	.025	.0515	.04
	0		
	.0072	.0085	.0122
	0	.006	0
8	.097		
	0	0	0
33	.147		
	0		
16	.036	.012	.047
94	.0007	0	.0025
92	.007	.025	.023
83	*1.97	0	0
	.192	*1.119	.039
	.032	.045	0
8	*1.75		
8	.085	.042	0
5	0	0	.219
25	.019	*.314	0
15	.021	.029	.063
	.02	.001	.0475
25	0	.017	0
34	.013		
11	.024	.016	.01
14	.05	*1.81	0
	0	0	0
	0	.006	.046
8	*1.65		
11			
33	.127	*1.03	0
33	0	.006	.007
18	.004	.052	.018
	.009	.042	*.516
55	.009	.0107	*.159
79	.012	.03	*.182
22	.028	*.364	.018
11	.005	.015	.025
11	.056	.006	.004

\*Relaid with





Street.	From—	To—	Square yards.	Year laid.	Cost.	Contractor.	Remarks.
First, NW, Louisiana avenue	B Four-and-a-half	C Sixth	527.00	1893		Day labor.	On concrete base. Front of District building.
Fifteenth, NW	Pennsylvania avenue	E Ninth	1,020.00	1894		II. L. Cranford	On concrete base. Do.
B, NW (north side)	Seventh	Ninth	2,374.00	1894		Day labor.	
B, NW (north side)	Ninth	Twelfth	7,017.89	1889		Lyons Bros.	
B, NW	Twelfth	Virginia avenue	2,964.26	1894		John W. Coburn	
F, NW	Twenty-fifth	Northward	2,943.00	1899		Day labor.	
Water	P						
Beckman place SE.	First	Second	1,790.93	1890	1.77	Washington Asphalt and Tile Co.	Laid on concrete.
Morris, NE	Sixth	Seventh	1,044.15	1897	1.77	do	
Canal, SW	B	C	1,180.69	1894	2.25	do	
Valley	F	U	8,848.56	1895	1.78	do	
Olive	Twenty-eighth	Thirtieth	1,674.50	1890	1.77	do	
Princeton	Thirtieth	Fortieth	2,833.26	1897	1.77	do	
Rosanoke	Thirtieth	Fortieth	2,115.01	1897	1.77	do	
Cleveland	Twelfth and W	Thirtieth and Flor	1,257.00	1886		Permit work.	
Former place.	U and Fortieth.	Q and Fifteenth.	1,025.00	1888		do	
Twenty-first	Q	Hillyer.	954.00	1884		do	
Defrees	North Capitol and H	First and I.	1,967.00	1884		do	
Jefferson place	Nineteenth and M	Nineteenth and N	1,393.00	1884		do	
Sunderland	Nineteenth and N	Twentieth and O	1,185.00	1885		do	
Hillyer	Twentieth and Q	Twenty-first and R	1,582.00	1884		do	
Riggs	Thirtieth and R	Fortieth and S	2,030.00	1886		do	
Wallach	T and Thirtieth	Fortieth and U	2,075.00	1886		do	
McLean	Third	Four-and-a-half	2,127.00	1887		do	
Arthur	B and First.	N J. avenue and G	1,366.00	1887		do	
First, NW (east side)	B	C	590.00	1893		P. Maloney	
Stoughton	Fortieth	Alley west of 14th	483.00	1888		Permit work.	
Chapin	Fortieth	Alley west of 14th	583.00	1888		do	
Columbia	Thirtieth	Fortieth	2,447.79	1900	1.77	Washington Asphalt and Tile Co.	
Harvard	Thirtieth	Fortieth	2,376.56	1900	1.77	do	
Kenesaw	Thirtieth	Fortieth	2,547.67	1900	1.77	do	
Kalorama	Eighteenth	Columbia Road	2,312.51	1900	1.77	do	
University place	Welling	Huntington	1,956.94	1900	1.77	do	

TABLE D—Continued.—*Virified-block pavements in the District of Columbia, July 1, 1900.*





TABLE D—Continued.—Granite and Belgian-block pavements in the District of Columbia, July 1, 1900—Continued.

Street.	From—	To—	Square yards.	Year laid.	Cost.	Contractor.	Remarks.
C. NE.	First.	Third.	5,481.79	1882	\$13,435.47	John Cudmore	
C. NE.	Third.	Fourth.	1,605.19	1884	4,847.82	J. A. Blundon	
C. NE.	Seventh.	Eighth.	2,139.51	1879	2,139.51	McKnight & Burns	
C. NE.	Ninth.	Tenth.	1,556.33	1872	5,681.53	George Netzey	
C. SW.	Sixth.	Seventh.	1,830.88	1887	4,755.37	John Cudmore	
D. NW.	Sixth.	Tenth.	6,278	1879	13,628.19	Jona. Taylor	
D. NW.	North Jersey avenue.	North Capitol.	1,617.31	1894	5,588.93	Hussey & McLaughlin	
E. NE.	Eleventh.	Thirteenth.	2,487	1879	5,385.74	Jona. Taylor	
E. NE.	North Capitol.	First.	2,912.98	1893	10,246.29	W. E. Chaffee	
F. NW.	Seventh.	Ninth.	527	1879	1,017.26	Wm. Buckley	North of railroad tracks.
F. SW.	One-half.	Four-and-a-half of Seventh.	6,777.49	1882	20,459.57	James Reynolds	
G. SW.	Intersection.	South Capitol.	396.35	1880		J. S. Baldwin	
G. SW.	Third.	Fourth.	6,516.95	1891	18,689.85	W. H. Mohler	
H. NW.	North Capitol.	Fourth.	8,337	1879	16,082.50	McKnight & Burns	
F. NW.	N. H. avenue	Twenty-fifth.	1,710.22	1894		J. W. Coburn	
H. SW.	Ninth.	Water	1,580.79	1883	5,104.71	P. Maloney	
I. SE.	South Capitol.	New Jersey avenue.	3,867.38	1900	.55	Andrew Gleeson	
K. NW.	Eighteenth.	Twenty-third.	1,619.12	1880		Cranford & Filbert	Front of market.
K. SW.	South Capitol.	Canal.	1,000			Superintendent streets	
K. NW.	Twenty-third.	Rock Creek.	12,517	1874	38,813.00	R. A. Shinn	
K. SW.	First.	Canal.				Hussey & McLaughlin	
M. NW.	Thirteenth.	Thirteenth.	1,705.57	1894	5,637.10	John Lyons	
M. NW.	Thirteenth.	Thirteenth.	6,640	1876	23,240.00	W. H. Mohler	
M. NW.	Fourth-and-a-half.	Sixth.	7,044.38	1877	72,186.78	W. H. Mohler	
M. SW.	Sixth.	Water	1,882	1891	6,883.36	Andrew Gleeson	
O. NW.	Seventh.	Eighth.	1,982	1892	3,993.29	Superintendent streets	
P. NW.	Thirteenth.	Thirteenth.	4,438.26	1876	8,744.13	Wm. Buckley	
P. NW.	Thirteenth.	Thirteenth.	3,481	1879	7,393.91	Ross & Mordock	
P. NW.	Thirteenth.	300 feet west of Rock Creek.	6,869.17	1879	14,498.19	do	
P. NW. (north side)	Thirteenth.	Thirteenth.	2,042.05	1879	3,902.13	Wm. Buckley	
P. NW. (south side)	Thirteenth.	Thirteenth.	1,988.51	1879	4,066.95	W. R. Davis	
P. NW.	Fourth-and-a-half.	Water	3,623.78	1884	14,633.13	Hines & Cudmore	
P. SW.	Third.	Seventh.	2,000			Superintendent streets	
Ind and La. ave.	Third.	Ninth.	9,243.47	1881	33,148.95	Thos. Joyce	
Louisiana avenue.	Eighth.	Ninth.	1,137	1879	2,274.45	do	



TABLE D—Continued.—Cobble pavements in the District of Columbia July 1, 1900.

Street.	From—	To—	Square yards.	Street.	From—	To—	Square yards.
South Capitol .....	M.....	N.....	3,246	Thirteen-and-a-half, SW	D.....	Maryland avenue .....	1,275
First, SW.....	M.....	N.....	2,314	D, SW.....	Four-and-a-half .....	Seventh.....	4,080
Third, SE.....	L.....	Georgia avenue.....	4,461	D, SW.....	Seventh.....	Fourteenth.....	6,786
Thirteen-and-a-half, NW	B.....	Pennsylvania avenue.....	5,095	School, SW.....	D.....	E.....	2,346
Nineteenth, NW.....	E.....	New York avenue.....	1,028	F, SW.....	Tenth.....	Twelfth.....	2,865
Twentieth, NW.....	S.....	Florida avenue.....	1,006	M, SW.....	South Capitol.....	Four-and-a-half .....	12,930
Twenty-second, NW.....	Virginia avenue.....	F.....	1,520	N, SW.....	South Capitol.....	Four-and-a-half .....	8,200
Twenty-third, NW.....	Virginia avenue.....	I.....	3,750	Maryland avenue.....	Third.....	Seventh.....	12,803
Twenty-fourth.....	G.....	Pennsylvania avenue.....	5,192	M, SE.....	South Capitol.....	Fourth.....	8,944
Twenty-fourth.....	Pennsylvania avenue.....	M.....	2,540	M, SE.....	Fourth.....	Eleventh.....	8,454
Twenty-sixth.....	G.....	River.....	4,700	N.....	South Capitol.....	Third.....	4,057
Twenty-sixth.....	G.....	K.....	5,042	Jackson.....	North Capitol.....	First.....	1,758
B, NW.....	Seventh.....	Ninth.....	3,898	Grace.....	Potomac.....	Thirty-second.....	1,758
B, NW.....	Ninth.....	Twelfth.....	5,396	Dumbarton.....	Rock Creek.....	Twenty-seventh.....	1,503
C, NW.....	Tenth.....	Fifteenth.....	5,400	Twenty-ninth.....	K.....	M.....	2,919
D, NW.....	Twelfth.....	Fourteenth.....	3,904	Thirtieth.....	K.....	Chesapeake and Ohio	1,616
E, NW.....	Seventeenth.....	Nineteenth.....	2,319	Jefferson.....	K.....	M Canal.....	2,839
E, NW.....	Nineteenth.....	Twenty-second.....	2,900	Thirty-first.....	K.....	Chesapeake and Ohio	1,833
H.....	Twenty-second.....	Twenty-sixth.....	3,254	Thirty-second.....	K.....	M Canal.....	3,540
H.....	Twenty-sixth.....	Twenty-seventh.....	1,066	Thirty-third.....	P.....	Thirty-third.....	5,667
New Hampshire avenue.....	Twenty-seventh.....	Pennsylvania avenue.....	12,967	Thirtieth.....	P.....	Thirtieth.....	3,540
Ohio avenue.....	Twelfth.....	Fifteenth.....	11,355	Potomac.....	M.....	Chesapeake and Ohio	3,100
Durham, SW.....	M, Four-and-a-half .....	O—Sixth.....	5,833	Thirtieth.....	K.....	M Canal.....	1,660
Shannon, SW.....	Missouri avenue.....	C.....	5,667	Thirtieth.....	M.....	Prospect.....	1,975
Ninth, SW.....	C.....	D.....	900	Thirtieth.....	M.....	Prospect.....	1,975
Tenth, SW.....	Maryland avenue.....	River.....	5,500	Thirtieth.....	M.....	Prospect.....	1,975

s and avenues for year end

WEST SECTION.

Straight curb reset.	Circular curb reset.	Straight curb set.	all cost Circular curb set	Name of contractor.
<i>Feet.</i>	<i>Feet.</i>	<i>Feet.</i>	<i>Feet.</i>	
39.64			820.55	Ayers Asphalt Paving Co.
62.50	9.45	958.85	25,497.48	Do.
1,165.53		385.85	417.85	Cranford Paving Co.
62.40		1,425.36	146.28	Ayers Asphalt Paving Co.
180.40		2,487.11	204.96	Do.
713.11		165.20	55,205.56	Cranford Paving Co.
			86.04	Do.
351.64		37.75	919.56	Do.

WEST SECTION.

1,013.38	28.04	291.25	37,770.27	Ayers Asphalt Paving Co.
1,001.97	25.85	156.06	25,103.57	Do.
			354.87	

EAST SECTION.

60.91		1,404.16	887.91	Washington Asphalt Block and Tile Co.
91.40		884.03	851.15	Do.
189.26		49.28	743.89	Do.
		1,800.63	885.60	Do.
670.57			21,072.04	Do.
		1,355.92	883.23	Do.
558.30	15.27	2,467.26	60,038.06	Andrew Gleason.

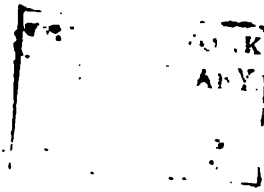
Laying.

EAST SECTION.

1,740.41		566.25	411.75	Washington Asphalt Block and Tile Co.
329.73		1,446.38	577.54	Ayers Asphalt Paving Co.
231.48		1,848.80	145.02	Do.
		1,431.71	882.22	Cranford Paving Co.

TOWN SECTION.

71.55		579.54	169.43	Washington Asphalt Block and Tile Co.
		699.88	51,720.90	Cranford Paving Co.
27.83		595.13	5,063.26	Do.
81.53	27.65	1,337.25	31,517.71	Washington Asphalt Block and Tile Co.



and suburban streets for year

of curb moved.	Straight curb reset.	Circular curb reset.	Straight curb set.	Cost	Name of contractor.
Lin. feet.	Lin. feet.	Lin. feet.	Lin. feet.	Lin. feet.	
306.00	312.25		840.16	52	Washington Asphalt Block and Tile Co.
				57	Day labor.
				78	Ayers Asphalt Paving Co.
				84	Do.
51.10	921.66		16.50	72	Washington Asphalt Block and Tile Co.
	1,498.60				
	84.90		12.80	55	Do.
	1,421.75			41	Do.
				98	Andrew Gleason.
				80	M. F. Talty.
				53	G. B. Mullen.
				00	J. A. Blundon, \$625.76; M. McNamara, \$944.99.
				49	E. G. Gummel.
				00	Matthew Myers, \$2,704.43 from appropriation 1899.
				06	Eastern Bermudez Paving Co., \$782 from appropriation 1899.
				57	Eastern Bermudez Paving Co.
	1,303.00			55	Ayers Asphalt Paving Co.
				20	
				31	
				33	McGuire & Hall.
	952.00		1,009.81	80	Cranford Paving Co.
				58	Washington Asphalt Block and Tile Co.
					Cranford Paving Co.

ing, \$980; includes \$2,626.27 paid from appropriation complete.

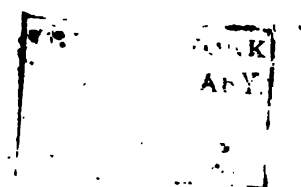


TABLE F.—*Repairs to asphalt and concrete pavements for year ending June 30, 1900.*

Street.	From—	To—	New 6-inch hydraulic base.	Resurfacing.	Vitrified block gutters.	Contract work.	Extra work.	Material.	Total cost.	Original pavement.	Year laid.	Original contractor.
6th NW.	Pa. ave.	Mo. ave.	528.13	1,851.61	276.85	\$4,568.09	\$117.66	\$336.85	\$5,022.60	Asphalt	1885	Barber Asphalt Paving Co.
6th NW.	Pa. ave.	La. ave.	115.35	791.75	115.35	1,894.18	42.95	109.82	2,136.96	do.	1885	Do.
Q NW.	7th	R. I. ave.	198.71	2,657.29	417.26	4,871.92	24.65	461.33	5,357.90	Coal tar	1887	H. L. Cranford.
Q NW.	N. Cap.	N. J. ave.		2,664.61	403.99	4,828.62	2.65	370.00	5,201.27	do.	1887	Barber Asphalt Paving Co.
H NW.	4th	7th		6,108.21	767.15	9,883.06	15.64	632.68	10,531.38	do.	1887	H. L. Cranford.
Q NW.	20th	21st		1,451.70	223.50	3,053.38	34.07	206.50	3,293.85	Concrete	1875	Cranford & Hoffman.
M NW.	10th	14th		5,337.84	831.50	11,355.25	331.88	251.83	12,438.88	Asphalt	1879	J. S. Baldwin.
Pa. ave.	Exec. ave	37th		4,032.13	271.66	7,394.27	180.36	235.90	8,809.53	do.	1877	W. W. Averill.
Pa. ave.	7th	8th		1,716.00	64.13	3,230.39	38.22	61.70	3,399.91	Asphalt	1877	J. O. Evans.
Scott circle.				6,466.07	445.46	11,820.36	487.37	509.51	12,817.24	Concrete	1873	Do.
22d	Pa. ave.	I.		1,998.28	292.85	2,413.03	13.78	231.28	2,658.09	do.	1873	C. E. Evans.
N. V. ave.	14th	15th		1,937.68	116.66	1,748.74	271.20	134.91	2,154.85	do.	1872	L. S. Filbert.
6th NW.	D.	E.		1,698.63	245.26	2,956.82	13.25	220.74	3,184.81	do.	1877	Jona. Taylor.
F NW.	18th	19th		2,227.86	236.25	3,718.45	49.05	220.24	3,985.76	do.	1873	C. E. Evans.
F NW.	21st	22d		2,253.19	300.71	4,048.50	119.95	270.62	4,439.07	do.	1873	Do.
8th NW.	R.	S.		1,892.11	280.37	3,421.23	7.42	273.70	3,702.35	Coal tar	1887	H. L. Cranford.
S NW.	Vt. ave.	12th		1,122.55	149.86	2,069.49	23.15	151.52	2,250.16	Concrete	1875	W. C. Mordock.
Va. ave. and B SW.			3,555.72	326.62	87.52	1,852.00	11.66	75.28	1,438.74	Asphalt	1879	J. S. Baldwin.
E.	13th	Pa. ave.	1,199.48	66.08	202.47	2,709.24	45.92	181.18	2,936.34	Asphalt block	1879	Cranford & Hoffman.
Pierce pl., 15th to 16th, and 10th, F to G, sidewalks.			103.55						99.40		1889	P. Maloney; replaced with asphalt.
Total									94,838.78			
Minor repairs									50,179.49			
Grand total.									145,018.27			

a Addition to original pavement.

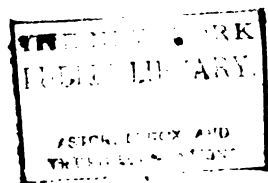


TABLE F.—*Repairs to asphalt and concrete pavements for year ending June 30, 1900.*

Street.	From—	To—	New 6-inch hydraulic base.	Resurfacing.	Vitrified block gutters.	Contract work.	Extra work.	Material.	Total cost.	Original pavement.	Year laid.	Original contractor.
6th NW.....	Pa. ave.....	Mo. ave.....	528.13	1,851.61	276.85	\$4,668.09	\$117.66	\$336.85	\$5,022.60	Asphalt.....	1885	Barber Asphalt Paving Co.
6th NW.....	Pa. ave.....	La. ave.....	115.35	791.75	115.35	1,984.18	42.95	109.82	2,136.95	do.....	1885	Do.
Q NW.....	7th.....	R. I. ave.....	198.71	2,657.29	417.26	4,871.92	24.65	461.33	5,357.90	Coal tar.....	1887	H. L. Cranford.
Q NW.....	N. Cap.....	N. J. ave.....		2,664.61	403.99	4,828.62	2.65	370.00	5,201.27	do.....	1887	Barber Asphalt Paving Co.
H NW.....	4th.....	7th.....		5,108.21	767.15	9,885.06	15.64	652.68	10,551.38	do.....	1887	H. L. Cranford.
Q NW.....	20th.....	21st.....		1,451.70	223.50	3,053.38	34.07	206.50	3,293.95	Concrete.....	1875	Cranford & Hoffman.
M NW.....	10th.....	14th.....		5,857.84	831.50	11,363.25	331.88	751.85	12,446.88	Asphalt.....	1879	J. S. Baldwin.
Pa. ave.....	Exec. ave.....	17th.....		4,032.13	271.93	7,394.57	188.36	235.00	7,817.93	do.....	1877	W. W. Averill.
Pa. ave.....	7th.....	8th.....		1,716.00	66.13	2,530.38	83.62	61.70	2,675.71	Asphalt.....	1877	J. O. Evans.
Scott circle.....				6,466.07	443.46	11,820.36	487.37	592.51	12,817.24	Concrete.....	1873	Do.
22d.....	Pa. ave.....	I.....		1,998.28	282.85	2,413.08	13.78	231.28	2,658.09	do.....	1873	C. E. Evans.
N. Y. ave.....	14th.....	15th.....		1,937.68	116.66	1,748.74	271.20	134.91	2,154.85	do.....	1872	L. S. Filbert.
6th NW.....	D.....	E.....		1,698.62	245.25	2,950.82	13.25	220.74	3,184.81	do.....	1877	Jona. Taylor.
P NW.....	18th.....	19th.....		2,231.86	236.25	3,718.45	49.05	220.54	3,985.76	do.....	1873	C. E. Evans.
F NW.....	21st.....	22d.....		2,233.19	300.71	4,048.50	119.95	270.62	4,439.07	do.....	1873	Do.
8th NW.....	R.....	S.....		1,892.11	280.37	3,421.23	7.42	273.70	3,702.35	Coal tar.....	1887	H. L. Cranford.
S NW.....	Vt. ave.....	12th.....		1,122.55	149.86	2,069.49	29.15	151.52	2,250.16	Concrete.....	1875	W. C. Murdock.
Va. ave. and B SW.....				3,355.72	87.62	1,952.00	11.66	75.28	1,438.74	Asphalt.....	1879	J. S. Baldwin.
E.....	13th.....	Pa. ave.....		66.08	202.47	2,709.24	45.92	181.18	2,936.34	Asphalt.....	1878	Cranford & Hoffman.
Pierce pl., 15th to 16th, and 10th, F to G, sidewalks.....										Asphalt block.....	1889	P. Maloney; replaced with asphalt.
Total.....									99.40			
Minor repairs.....									94,838.78			
Grand total.....									50,179.49			
									145,018.27			

a Addition to original pavement.

TABLE G.—Work done at cost of railroad companies.

Companies.	Street.	From—	To—	Amount.
City and Suburban	G, NW .....	Intersection Fourteenth.		\$6.04
	G, NW .....	Intersection Ninth.		51.07
	G, NW .....	Intersection Seventh.		41.40
	G, NW .....	Intersection Fifth.		12.38
	G, NW .....	Seventh .....	Twelfth .....	31.07
	G, NW .....	Second .....	Fourth .....	.82
	Fifth, NW .....	Intersection Massachusetts avenue.		10.18
	D, NW .....	New Jersey avenue .....	First .....	16.31
	Fourteenth, NW .....	Intersection Pennsylvania avenue.		9.02
				178.69
Columbia .....	New York avenue .....	Intersection Tenth.		7.08
	New York avenue .....	Intersection Twelfth.		2.46
	Massachusetts avenue .....	Intersection Fourth.		4.10
	Massachusetts avenue .....	Fourth .....	Seventh .....	96.21
	H, NW .....	First .....	Third .....	30.84
	H, NE .....	First .....	Fifteenth .....	38.54
	New York avenue .....	Thirteenth .....	Fourteenth .....	9.68
	Massachusetts avenue .....	Fourth .....	Seventh .....	12.36
	H, NE .....	North Capitol .....	First .....	18.04
	New York avenue .....	Intersection Ninth.		4.92
	H, NE (south side) .....	Third .....	Fifteenth .....	22.14
	New York avenue .....	Intersection Tenth, Twelfth, and Thirteenth.		9.02
				254.39
Metropolitan .....	Connecticut avenue .....	L .....	Dupont circle .....	1.64
	D, NW .....	First .....	Third .....	24.70
	Four-and-a-half .....	Missouri avenue .....	Maryland avenue .....	10.45
	Fourteenth .....	Intersection New York avenue.		5.58
	F (north side) .....	Ninth .....	Fourteenth .....	8.55
	Thirty-fifth .....	O .....	P .....	4.10
	West side Dupont circle .....	Intersection Pennsylvania avenue.		.32
	Ninth .....	Intersection Pennsylvania avenue.		4.08
	D, NW .....	New Jersey avenue .....	First .....	4.54
	P street bridge approach (north side) .....	First .....		1.07
	South and west sides Dupont circle .....	Intersection Tenth.		20.12
	F, NW .....	Intersection Tenth.		4.50
	Thirty-fifth .....	N .....	O .....	4.92
				95.37
Capital Traction ..	Fourteenth .....	Southeast side Thomas circle.		0.82
	Seventh (west side) ..	Pennsylvania avenue ..	D .....	4.32
	Pa. avenue, NW .....	First .....	Fifteenth .....	26.33
	Pa. avenue, NW .....	Intersection Fifteenth.		12.00
	Fifteenth .....	Fifteenth .....	Eighteenth .....	79.54
	Pennsylvania avenue ..	Pennsylvania avenue ..	New York avenue ..	8.39
	M, NW .....	Twenty-first .....	Twenty-third .....	2.46
	M, NW .....	Twelfth .....	Thirtieth .....	6.56
	M, NW .....	Bridge .....	Thirtieth .....	6.56
	First, NW .....	Pennsylvania avenue ..	Maryland avenue ..	63.60
	Pennsylvania avenue ..	Intersection Seventh.		7.11
	Fourteenth (west side) ..	M .....	Euclid .....	2.46
	Pa. ave. (north side) ..	Twenty-third .....	Twenty-sixth .....	2.02
				222.17
Anacostia and Potomac River.	Eleventh, NW .....	Massachusetts avenue ..	V .....	7.06
	Second, SW .....	C .....	Virginia avenue .....	6.06
	O, NW .....	Fifth .....	Sixth .....	3.28
				16.90

TABLE H.—Work done by day labor under the appropriation for "Current repairs to streets, avenues, and alleys," from July 1, 1899, to June 30, 1900.

Brick sidewalk relaid .....	square yards..	12,219
Asphalt block paved .....	do .....	312
Asphalt block repaved .....	do .....	1,680
Vitrified brick repaved .....	do .....	635
Vitrified block paved .....	do .....	571
Vitrified block repaved .....	do .....	987
Cobble pavement .....	do .....	5,242
Curb set .....	linear feet..	549
Curb reset .....	do .....	2,360
Flag relaid .....	do .....	4,736
Granite block relaid .....	square yards..	1,060
Asphalt tile sidewalk relaid .....	do .....	950
Cement sidewalk .....	do .....	502
Grading .....	cubic yards..	2,879
Graveling .....	square yards..	1,600
Labor .....		\$14,635.17
Material .....		\$1,497.35





2044	1002, 1004, 1006 B street SW	Jas. Frazier	249.63	9.50	251.30	1.0	80	91.51
2045	Alley between O and P, Thirty-fourth and Thirty-fifth.	W. T. Weaver	80.56		77.50			271.76
2046	1115 Eleventh street SE.	R. A. Rollins			7	134	2	26.43
2047	Northeast corner Eleventh and F streets NE.	A. McCandlish				94		21.43
2048	409 Fourth street NW	C. A. Langley			27			4.73
2049	1213 F street NW	Gasch Bros.	46.80					40.28
2050	Northeast corner Thirteenth and K streets NW.	W. C. Clephane	57.90	15	28.60			70.94
2051	North side E street NW., between Twenty-third and Twenty-fourth.	Frank T. Rawlings		80.32				66.35
2052	Rhode Island avenue NE., between Fifth and Sixth.	Daniel & Arnot	161.66				23	208.02
2053	7 and 9 Hanover place	W. H. Saunders	25.54	51.63				74.92
2054	1746, 1748 M street NW	W. H. Saunders	52.93					55.21
2057	602 Pennsylvania avenue NW.	P. Letterer	54.04					56.75
2058	North side Cincinnati street, from Adams Mill road to property Capital Traction Co. NW.	E. J. Stellwagen					5,591	1,408.51
2059	1310 Massachusetts avenue NW.	Robt. Hinkley	42.59		25.65			46.97
2060	East side First SE., from Hickman to F.	Beck & Weller	289.09					292.33
2061	631 B street NW	G. H. Hammond & Co.			18	43	15	70.85
2062	1622 S street NW	Mary E. K. Waterman	25.22					25.42
2063	Metropolitan Hotel, Sixth street, between Pennsylvania and C.	H. Kozier Dulaney	525.63					594.64
2064	Northeast corner Sixth and D streets NW.	Wm. W. Stewart	89.09	11.25	53.85			106.04
2065	1832 Sixteenth street NW	Jno. C. McLaughlin	32.14		29			36.97
2068	Nineteenth and Kalorama avenue, front lots 124-130, Widow's Mile.	John H. Nolan		153.25		20		130.12
2069	2131 R street NW.	Chas. A. Langley	20.26					31.34
2070	Thirty-sixth, front of lots 7 and 8, block 9, Oak View.	D. F. Weaver		10			210	129.22
2071	I street NW., between Fifteenth and Sixteenth, front lot 6.	Chas. E. Foster	67.94					68.48



21001	South side of between Holmead avenue, West side Holmead, between Whitney and Lydecker ave- nues. North side Lydecker, between Fourteenth and Holmead avenue.	Wm. F. Mattingly	1,801.83					800		1,712.15
21002	C street, between Delaware avenue and South Capitol. Delaware avenue, between C and D SW.	Thos. W. Smith				86				80.20
21003	Alley in square 8/4, near new Census Office.	Mat G. Emery	24			27		4		63.48
21004	2000 University place	Wm. Hungerford		29.67						22.90
21005	Linden street NE, between Twelfth and Thirteenth.	Percy H. Russell		62.08	67.50					76.19
21006	Southwest corner Eighteenth and F streets NW.	Mrs. A. E. F. Stewart			8	12		5		30.00
21007	Northeast corner North Capitol and F streets	Baltimore and Ohio R. R.			20	300		12		63.84
21008	1310 Eighteenth street NW	R. L. Preston		5.10						9.10
21009	5 Iowa circle NW	Ralph H. Lee		23	5.40					24.08
21010	Fourteenth and Bonafonte NW, Bonafonte street side.	O. W. White				9		14		26.00
21011	601 L street SE	H. M. Carver			8	10		21		37.68
21012	Northeast corner Seventh and N streets NW	Henry Conradis		80.83	61.10					96.87
21013	423 423 Eighth street and 308 312 C street SE.	Geo. R. Repetti		102.40	108					122.40
21014	Fifteenth street, between U and V streets NW., Fortner Flats.	C. A. Didden		84.53						86.20
21015	1108 1110 Yale street, Columbia Heights.	Jenny Kinnon		27.48						28.00
21016	Corner Eleventh and Pennsyl- vania avenue NW., Evening paper Co.	Evening Star News- paper Co.	239.64							235.56
21017	Star Building.									
21018	930 C street NW	A. P. Clark, Jr.	20	82.84	5					42.58
21019	Southwest corner Seventh and I streets NW.	Benj. B. Bradford	15	151.20	149.60					216.06
21020	125-129 First street SW	Boston Baking Co.			35	55		50		125.08
21021	1101 Twenty-fourth street NW	J. W. Moore		19.02						19.17















2209	Alley, block 8, D. D. D. square	874	282.61	1,800		32	66	258.62	12			352.92
2220	M street NW., from Fifth to Sixth (south side)						20					106.89
2205	South Carolina avenue SE., from Thirteenth street eastward	128	329.89		115			397.71				745.75
2207	Fourteenth street NW., from I to K (west side)	120	216	20		10		80				835.70
2212	Alley, square 690											3,064.56
2214	Third street SE., from East Capitol to Pennsylvania avenue (both sides)		1,636.93				1,423.41	15.25				
2221	East Capitol, from Tenth to Eleventh (north side)		347.48					250				397.95
2223	Fourteenth street, between B and C NE. (east side)	480			82			52				206.69
2224	Alley, square 69	328	735									1,122.60
2225	Alley, square 733											896.00
Total		19,570.08	38,807.74	22,655	7,281	265	38,236.56	13,599.21	260	16	149	86,154,848.87

TABLE L.—Replacing and repairing sidewalks and curbs around public reservations and municipal buildings.

No.	Location.	Cement sidewalk.	Curb set.	Curb re-set.	Grading.	Brick sidewalk repaved.	Cobble.	Granite block.	Flag re-laid.	Asphalt tile sidewalk.	Cost.
		Sq. yards.	Linear ft.	Linear ft.	Cu. yards.	Sq. yards.	Sq. yards.	Sq. yards.	Linear ft.	Sq. yards.	
8003	Pennsylvania avenue, between Eighteenth and Nineteenth streets (south side).....	521.23	379.59	.....	.....	.....	.....	.....	.....	.....	\$836.90
8007	T street NW., from Thirty-fifth street westward (north side).....	467.34	388.53	17.90	.....	.....	.....	.....	.....	.....	770.07
8008	U street NW., from Thirty-fifth street westward.....	440.56	388	15.25	172	.....	.....	.....	.....	.....	806.89
8018	Indiana avenue, front of reservation; Indiana avenue NW., between Third and Fourth streets (north side).....	161.10	5	292.23	.....	.....	.....	24	.....	.....	243.73
8019	C street side of reservation, east of Second street (north side).....	146.49	.....	106.80	.....	.....	.....	11½	.....	.....	169.05
8020	Reservation on Pennsylvania avenue SE., between Seventh and Eighth streets (south side).....	55.17	8.07	100	.....	.....	.....	.....	.....	.....	75.27
8021	Reservation on First street NW., between M and New York avenue (west side).....	107.10	.....	.....	.....	.....	.....	2½	.....	.....	105.82
8022	B street SW., between Ninth and Tenth streets (north side).....	594.72	48.44	341.90	.....	.....	.....	.....	.....	.....	722.18
8033	Reservation, bounded by Virginia and Georgia avenues, Ninth, and Eleventh streets SE.....	600	1,635.08	120	.....	385	184	40	40	.....	2,161.43
8035	Reservation bounded by F, K, and L streets SE.....	1,025	54.08	.....	.....	.....	.....	.....	.....	.....	906.23
8053	Lafayette square.....	2,400.90	.....	.....	.....	.....	.....	.....	.....	.....	7,287.35
8054	Johnson School, corner Grant and School streets.....	4,606.73	.....	.....	.....	.....	.....	.....	.....	.....	7,741.14
8061	Seventeenth and B streets, abutting Washington Monument Park.....	.....	298	.....	262	.....	10	.....	52	802	881.07
	Total.....	7,700.46	6,576.61	1,007.16	424	885	144	76	92	802	15,197.13



TABLE M.—Miscellaneous work—Continued.

No.	Location.	Appropriation.	Grading, cubic yards.	Brick sidewalk paved, square yards.	Brick sidewalk repaved, square yards.	Cement sidewalk, square yards.	Curb set, linear feet.	Curb reset, linear feet.	Cobble roadway, square yards.	Macadam road way, square yards.	Granite block repaved, square yards.	Vitrified block paved, square yards.	Asphalt block paved, square yards.	Plank steps, linear feet.	Brick wall, cubic yards.	Cobble gutters, square yards.	Vitrified brick gutters, square yards.	Cost.
8036	N street SW., between Third and Four-and-a-half streets (north side.)	Improvements and repairs, south-west section.																\$7.70
8037	Alleys in square 802 and square 628.	Retent of Hussey & Brown.																14.53
8038	N street SW., between Third and Four-and-a-half streets (both sides).	Improvements and repairs, south-west section.		1,706					88				88					764.54
8039	Providence Hospital.	Isolating ward, Providence Hospital.																80.00
8040	Kansas avenue.	Grading and regulating Kansas avenue.																86.00
8041	D street NE., between Massachusetts avenue and Fourth street (both sides).	Improvements and repairs, north-east section.					711.64											662.81
8042	D street NE., between Sixth street and Maryland avenue (both sides).	.....do					881.00											719.20
8044	Brightwood avenue, across Rock Creek Park.	Roadway from Brightwood avenue across Rock Creek Park.																218.11
8045	Twenty-second street, Langdon	Twenty-second and Twenty-fourth streets, Langdon.														133.00		1,271.20
8047	Connecticut avenue, north of Klinge road	Connecticut avenue extended																16.50
8048	Thirty-seventh street, from Y to back street.	Thirty-seventh street.																206.94
8050	Connecticut avenue, west of Rock Creek.	Connecticut avenue extended																634.14
8051	Connecticut avenue, just beyond Cleveland Park.	.....do																20.72
8052	C street, between F and H streets NE.	Improvements and repairs, north-east section.	18		490				8			60						227.83
8053	Branch avenue	Grading Pennsylvania and Branch avenues.																809.05
8055	Illinois avenue, from Omaha street north.	Improving Illinois avenue														707.47		951.80



TABLE N.—Whole-cost work.

No.	Location.	For whom done.	Grading.	Cement side-walk laid.	Curb reset.	Con-crete base.	As-phalt block.	Brick side-walk relaid.	Granite block road-way.	Cobble-stone.	Cobble gutters.	Curb set.	Asphalt tile side-walk.	Cost.
			Cu. yds.	Sq. yds.	Lin. ft.	Cu. yds.	Sq. yds.	Sq. yds.	Sq. yds.	Sq. yds.	Sq. yds.	Lin. ft.	Sq. yds.	
5001	53 I street NE	W. H. Marlow		21.09										\$20.87
5002	Indiana avenue NW, west side Second street.	Metropolitan Rwy. Co.		22										21.56
5003	Alley, rear 316 Pennsylvania avenue.	Browning & Balnes	14			16								7.93
5004	Kalorama avenue, between Eighteenth street and Columbia road.	E. C. Kellogg.												19.00
5005	Southwest corner Seventh and I streets NW.	Benjamin J. Bradford		135.42										130.00
5006	125-129 First street SW.	Boston Baking Co.	25				85							154.65
5008	1545 Sixth street NW.	W. O. Shreve.						15						27.47
5009	E street NE, between Fourth and Fifth streets.	Harry Williams, manager	14		80					2				60.73
5010	Seventeenth street, between Grant and Lowell streets (both sides).	S. C. Briggs									271.8			100.49
5011	First street, between B and C streets NW. (west side).	Ed. McCauley	6		7		30					4.71	8	55.04
5012	S street NW, between Phelps place and Twenty-fourth street.	Davidson & Davidson												140.00
	Total.....		464	178.51	85	16	105	15	89	2	271.8	4.71	8	787.54

# OPERATIONS OF THE ENGINEER DEPARTMENT, D. C. 111

D.—Number of square yards and cost charged for repairs to cuts made by plumbers and others in streets, avenues, and alleys during the year ended June 30, 1900.

- o. 1 shows the number of cuts repaired for various plumbers.  
o. 2 shows the number of cuts repaired and the cost thereof on "whole cost" work, to per cent is added for tools, clerk hire, etc., for the maintenance of the "Deposit and assessed," which fund is used to pay all accounts for labor, material, tools, etc., used in this class and also includes the work done for gas, electric light, and telephone companies, which is at the "flat rates" charged plumbers.  
o. 3 shows the number of cuts repaired on account of the sewer department and the cost me.  
o. 4 shows the number of cuts repaired on account of the water department and the cost me.  
o. 5 shows the number of cuts repaired and work done on account of other appropriations strict and the cost of the same.

	Number.	Square yards.	Cost (amount charged).
<b>1.—Plumbers' cuts:</b>			
Sheet asphalt.....	218	449.95	\$1,417.34
Granite block.....	132	541.20	740.62
Asphalt block.....	287	889.70	1,201.09
Vitrified block or brick.....	99	299	403.60
Cobblestone and rubble.....	406	734.40	330.30
Macadam.....	71	155.42	56.80
Granolithic.....	223	154.54	536.83
	<b>1,436</b>	<b>3,224.21</b>	<b>4,686.58</b>
<b>2.—Anacostia and Potomac River Rail Road, City and Suburban Rail Road, Capital Traction Co., Brightwood Rail Road, United States and Potomac Electric Light Co., Washington Gas Co., Chesapeake and Potomac Telephone Co., etc.....</b>	<b>1,477</b>	<b>42,321.07</b>	<b>36,154.83</b>
<b>3.—Various appropriations of the sewer department.....</b>	<b>490</b>	<b>17,722.30</b>	<b>18,088.54</b>
<b>4.—Pumping expenses and pipe distribution, water department.....</b>	<b>399</b>	<b>15,586.11</b>	<b>13,262.60</b>
<b>5.—Various appropriations of the District other than above, including repairs to streets and roads, street lighting, telegraph and telephone service, improvements and repairs, assessment and permit work, etc.....</b>	<b>177</b>	<b>5,929.16</b>	<b>11,135.15</b>
<b>Total.....</b>	<b>3,979</b>	<b>84,782.85</b>	<b>83,327.70</b>

Following is a comparison between the plumbers' cuts during the year ended June 30, 1900, and the ten preceding years, but does not include the small work of other trades, which is included in Table No. 2:

yr.	Number.	Square yards.	Cost.	Year.	Number.	Square yards.	Cost.
.....	393	2,085.06	\$3,712.06	1895-96.....	1,305	11,941.03	\$14,156.18
.....	852	3,899.61	6,488.02	1896-97.....	1,016	15,058.07	25,530.55
.....	980	5,220.50	6,994.58	1897-98.....	1,659	7,022.37	11,718.27
.....	2,132	8,694.67	14,025.68	1898-99.....	1,524	6,728.05	10,316.83
.....	1,583	9,233.25	15,272.72	1899-1900.....	1,436	3,916.00	4,686.58
.....	1,236	6,718.57	9,267.71				

## REPORT OF THE SUPERINTENDENT OF COUNTY ROADS.

WASHINGTON, July 1, 1900.

SIR: I have the honor to submit report of the operations of the road division during the fiscal year ended June 30, 1900.

GEO. A. BEALE,  
*Superintendent of Roads.*

LANSING H. BEACH,  
*Corps of Engineers, U. S. A.,  
Engineer Commissioner, District of Columbia.  
(through the Computing Engineer.)*

## 112 OPERATIONS OF THE ENGINEER DEPARTMENT, D. C.

*Expenditures for repairing county roads and suburban streets, fiscal year 1899-1900.*

Location.	Amount.	Location.	Amount.
CENTRAL SECTION.		CENTRAL SECTION—continued.	
Rhode Island avenue and Brentwood road.....	\$99.12	Blair road, between Baltimore and Ohio crossing and Carroll avenue.	\$118.50
Seaton street from First street westward.....	87.68	Brightwood avenue, from Rock Creek church road to District of Columbia line.....	15,407.39
Howard avenue from Fourteenth to Sixteenth, Mount Pleasant.....	143.38	Grant road, between Wisconsin and Albemarle street.....	561.50
Rhode Island avenue and Brentwood road.....	150.50	Sixteenth street NE, near Gales street	28.06
Bennings road, near the bridge.....	7,927.97	Seaton street, between North Capitol and First streets NW.....	15.70
Fifteenth, between Kenesaw and Columbia road.....	351.61	Holmead avenue, from No. 3457 southward.....	35.00
Cincinnati street, near Bridge No. 30.	157.98	Harvard, between Thirteenth and Fourteenth streets.....	49.52
Seaton street, between First and Le Droit.....	457.58	Pomeroy, from Linden eastward.....	225.16
Blair road, from Piney Branch road to District of Columbia line.....	114.25	Linnean Hill road, between Sixteenth and Eighteenth.....	677.87
First and Seaton streets, northwest corner.....	12.17	Mattingly tract.....	257.74
S street, from First to Le Droit.....	367.44	Grant street, between Seventeenth and Eighteenth.....	422.30
Prospect street, east of Lincoln avenue	75.62	North Capitol and S streets.....	10.95
Flint street, between Illinois avenue and Ninth street NW.....	82.50	Central avenue, Ivy City.....	75.40
Flint street, from Brightwood avenue eastward.....	607.07	Seventeenth, between Lowell and Grant streets.....	137.37
Queens Chapel road to Providence street.....	41.75	Capitol avenue, Ivy City.....	67.41
Concord street, between Tenth and Thirteenth, Brookland.....	689.46	Central avenue, Woodridge.....	74.75
Klingbe road, from Linnean Hill road to Rock Creek.....	33.00	Dangerous holes and minor repairs..	6,244.52
Hartford street, between Ninth and Tenth.....	186.04		38,763.10
Bennings road, east of Fifteenth.....	679.33	WESTERN SECTION.	
Whitney avenue, between Brightwood and Sherman avenue.....	788.49	Military road, from Daniel road to Rock Creek.....	520.24
Philadelphia street, between Thirteenth and Fourteenth NE.....	180.95	U street, between Thirty-fifth and Thirty-sixth.....	16.50
Harewood avenue, from Maple to Oak.....	145.39	Thirty-fifth, between Milwaukee and Newark.....	15.50
S street NW., between North Capitol and First.....	94.61	Daniel road, opposite Rock Creek Park.....	73.50
Bunker Hill road, east Queens Chapel Road.....	393.95	Dangerous holes and minor repairs..	4,932.76
Illinois avenue, between Chesapeake and Des Moines.....	28.69		5,556.50
Bates road, from Rock Creek church road to Sargeant road.....	206.28	EASTERN SECTION.	
Philadelphia street, between Tenth and Thirteenth streets.....	173.94	Nichols avenue, from Sheridan avenue southward.....	1,516.07
Howard street, westward from Brown street.....	77.37	Dangerous holes and minor repairs..	2,321.53
			4,137.60

# OPERATIONS OF THE ENGINEER DEPARTMENT, D. C. 113

## Expenditures for repairing county roads and suburban streets—Continued.

### SUMMARY.

entral section.....	\$38,763.10
stern section.....	5,658.50
stern section.....	4,137.60
re of horse and buggy.....	328.00
larica, surface division.....	2,328.00
larica, property division.....	465.00
acksmithing.....	479.17
el, purchase of tools, and miscellaneous labor.....	2,485.09
rchase of trap rock, macadam, and freight on same.....	15,966.78
	70,511.19
ount of appropriation.....	\$60,000.00
ount of repayments.....	10,520.00
	70,520.00
Balance of appropriation.....	8.81

st of employees, surface division, temporarily required, and appropriations from which paid, for year ended June 30, 1900.

Class.	Number.	Assessment and permit work.	Improvements and repairs.	Repairs to streets, etc.	Sidewalks and curbs around public reservations.	Repairs to county roads.	Constructing county roads.	Bridges.
Assistant engineers.....	4	\$1,004.57	\$1,130.14	\$1,506.85	\$94.18	\$408.10	\$879.00	\$1,255.71
Inspectors.....	20	2,055.72	4,062.56	4,383.08	110.25	299.11	1,984.38	1,010.15
Foremen.....	24	3,128.18	301.00	1,844.06	140.20	4,556.60	720.00	1,224.00
Other employees.....	962	30,702.05	14,167.08	20,315.55	2,424.45	45,459.10	15,850.75	17,898.50
Total.....		36,890.52	19,660.78	28,049.54	2,769.08	50,722.81	19,434.13	21,388.36

Class.	Repairs to market houses.	Western High School, 1898.	Various deposits.	Nineteenth street, from Florida avenue to Columbia road.	Isolating building, Providence Hospital.	High water service.	Care and improvement Rock Creek Park.
Assistant engineers.....	\$4.00	\$16.00	\$2,760.00	\$308.00	\$180.00		
Inspectors.....	14.00	102.00	28.00			\$42.06	\$1,402.00
Foremen.....	64.87	1,266.84	344.24			404.38	15,352.99
Total.....	82.87	1,384.84	3,132.24	308.00	180.00	446.44	16,751.99

Class.	Industrial Home School.	Roadway across Rock Creek Park.	Emergency fund.	Emergency repairs to roads and bridges.	Deposit and assessment fund.	Grading streets, alleys, and roads (team-hire).	Total.
Assistant engineers.....							\$6,278.55
Inspectors.....							17,173.25
Foremen.....	\$14.00	\$210.00	\$14.00	\$280.00	\$2,808.00		16,828.00
Other employees.....	75.87	2,348.00	45.30	4,263.78	21,272.58	\$5,213.16	197,403.14
Total.....	89.87	2,558.00	59.30	4,483.78	24,080.58	5,213.16	237,088.94

## REPORT OF THE ENGINEER OF BRIDGES.

WASHINGTON, D. C., July 1, 1900.

CAPTAIN: I have the honor to submit the following report for the fiscal year ended June 30, 1900:

The expenditures under "Ordinary care of bridges" were as follows:

Amount of appropriation .....	\$4,000
Salaries .....	\$3,634.62
Coal oil and contingencies .....	46.02
Paint purchased .....	315.00
Balance .....	4.36
	<hr/> 4,000

The work of "Construction and repair" is shown by the annexed table. The regular repairs consisted of painting the iron work, renewal of floors, and such minor repairs as were from time to time required. The structures are in good condition, requiring only such repairs as are due to their regular and continued use. An exception from this statement should be made in the case of the Navy-Yard (or Anacostia) Bridge, which has been considered structurally weak, and since the employment of the heavy motor cars of the Anacostia Railway Company, particularly so. The bridge should be replaced by a heavier and more modern structure, as previously recommended. The principal item of construction was for the Piney Branch Bridge. This bridge is a substantial steel structure built by the Toledo Bridge Company. It is 300 feet long, 24 feet wide, with 7 spans, 3 of 30 feet, 2 of 60 feet, and 2 of 45 feet, supported on 3 trestle bents, 40 to 50 feet high, with granite abutments. The approach is via Columbus avenue by an easy grade and diverts the travel from the Linean Hill road, avoiding the heavy grade of that road and affording a greatly improved route of travel. Eventually the Linean Hill road, from Columbus avenue bridge No. 25, crossing Piney Branch, may be abandoned. The improvement of Bennings Road required the raising of the causeway at west end of Bennings Bridge. The causeway running across the marsh called for a large amount of earth filling, which was done in connection with the improvement of the balance of the road. The heavy rain storm of June 1 caused an unusual amount of damage to the culverts and bridges in the District, as well as to the county roads. From the special appropriation for "Storm damage repairs" the following amounts have been paid:

Culvert on Queens Chapel road, near the District line, was badly damaged and in a dangerous condition; this was considered of insufficient capacity and was rebuilt of larger dimensions, a 6-foot arch being substituted for a 4-foot. The cost of this work was .....	\$359.45
Two culverts on Queens Chapel road, between Brentwood road and Langdon, arches repaired .....	116.99
Culvert on Sargent road, near Bunker Hill road .....	77.30
Culvert on Sargent road, near District line .....	20.00
Two plank culverts in Langdon .....	30.00
Culvert at Ivy City, near race course .....	15.00
Culvert on Lovers lane, arch repaired .....	21.46
Culvert on Brentwood road .....	22.19
Culvert on Bladensburg road, cleaning out .....	20.00
Total .....	<hr/> 682.39

*Expenditures, construction and repair of bridges, 1900.*

Order.	Bridge.	Character of work.	Cost.
6001	54	Paint .....	\$870.70
6002		Construct culvert north Military road .....	531.19
6004		Various bridges, repairs July 16-31 .....	7.25
6005	30	Set curb and lay cement walk .....	44.04
6006		Various bridges, repairs Aug. 1-15 .....	13.94
6007	27	Lay new floor .....	1,629.46
6008	30	Paint .....	878.87
6009	27	do .....	410.68
6010		Various bridges, repairs Aug. 16-31 .....	17.50
6011		Various bridges, repairs Sept. 1-15 .....	7.25
6012		Iron culvert on Galveston, between Twentieth and Twenty-second streets .....	38.38
6014		Various bridges, repairs Sept. 16-30 .....	16.75
6015		Various bridges, repairs Oct. 1-15 .....	2.50
6016	62	Lay new floor and paint .....	58.92
6017	51	Reconstruct culvert on Anacostia road .....	384.61
6018		Cleaning various bridges .....	19.12
6019		Various bridges, repairs Oct. 16-31 .....	12.00
6020		Extension of head wall of culvert Nichols avenue and Stickfoot Branch .....	103.49
6021		Various bridges, repairs Nov. 1-15 .....	6.00
6023	26	Paint .....	61.00
6024		Various bridges, repairs Nov. 16-30 .....	15.37
6025		Various bridges, repairs Dec. 1-15 .....	30.06
6026		Various bridges, repairs Dec. 16-31 .....	4.75
6027		Filling test pits Massachusetts avenue bridge .....	39.69
6028		Various bridges, repairs Jan. 1-15 .....	8.00
6029		Various bridges, repairs Jan. 16-31 .....	5.62
6030		Various bridges, repairs Feb. 1-15 .....	7.75
6031		Guard rail of new bridge over Piney Branch .....	37.68
6032		Repair roadway near bridge (Bennings road) .....	314.27
6034	62	Paint .....	557.60
6035		Various bridges, repairs Mar. 1-15 .....	9.38
6036		Various bridges, repairs Mar. 16-31 .....	19.05
6037		Various bridges, repairs Apr. 1-15 .....	6.00
6038		Various bridges, repairs Apr. 16-30 .....	4.49
6039		Guard fence, Back street and Tunlaw road .....	37.16
6040		Various bridges, repairs May 1-15 .....	5.19
6041	34	Relay floor .....	125.67
6042		Various bridges, repairs May 16-31 .....	16.44
6043		Various bridges, repairs June 1-15 .....	56.88
6046		Various bridges, repairs June 16-30 .....	7.00
6047		Macadam Columbus avenue, approach to Piney Branch Bridge .....	172.56
12659		Piney Branch Bridge .....	8,129.11
		Salaries .....	2,972.00
		Stone purchased .....	2,679.73
		Inspection .....	289.85
	30	Adjusting knee braces .....	81.40
		Plans Military road and Rock Creek Bridge .....	35.00
		Tools purchased .....	52.82
		Paint purchased and on hand .....	55.00
		Filling causeway Bennings Bridge .....	4,074.82
		Specifications .....	7.13
		Miscellaneous labor .....	4.94
		Balance of appropriation .....	4.41
		Amount of appropriation .....	\$25,000.00
		Repayments .....	175.47
			25,175.47

<sup>1</sup> Contract,

Respectfully submitted.

GEO. H. BAILEY,  
*Engineer of Bridges, District of Columbia.*

Capt. LANSING H. BEACH,  
*Corps of Engineers, U. S. A.,  
Engineer Commissioner, District of Columbia.*  
(Through Captain Newcomer.)

## REPORT OF THE SURVEYOR.

WASHINGTON, D. C., *July 31, 1900.*

CAPTAIN: I have the honor to submit the following report of the transactions of the surveyor's office for the fiscal year ending June 30, 1900, and to make certain recommendations regarding the force necessary and the general conduct of the office.

Six hundred and one lots were surveyed in city and county, involving the making of 474 certificate plats of survey, in duplicate—a total of 975 plats, including a small number of extra duplicates.

To prepare for these surveys, 200 plats of entire squares were made, and alterations made on existing plats. Total plats under this head, 1,449.

Two hundred and thirty-six subdivisions were recorded, involving 472 separate subdivision certificates and 236 plats as pages of record books. Total plats under this head (including about 40 not adopted), 748.

For private parties, the following county subdivisions have been made and recorded: Deanwood Heights; part of Chichester; part of Woodley Park; a second part of Woodley Park; McEuen tract; part of Friendship and Mount Airy; Mattingly tract.

The following outline surveys were made in the county: The Highlands; part of Girls' Portion; tract south of block 2, Meridian Hill, with projection of W street; part of Glenwood Cemetery; line between Clark and Shugrue, Conduit road; part of Whitehaven; part of Vineyard; part of Cleveland Park; part of Bellevue; part of Metropolis View; part of Friendship; part of Youngsboro; Shoemaker tract near Tennallytown; part of Grasslands; German Orphan Asylum; part of Sheriff estate.

In all, for private parties, 23 large plats, signed and issued, involving an average of two working plats in each case—total, 69 plats.

For the District of Columbia and the United States the following surveys were made: Two lots in square 1277; lot in square 381; lot 2, square 787, for Smithsonian Institution; two lots in square 1287; three lots in Columbia Heights; school lot at Takoma; one lot in Barry farm; land in Clermont; Woodward's lot, near Brightwood; division line between Baker and Brown's subdivisions, Mount Pleasant; Clark tract, Bladensburg road; Battleground Cemetery, at Brightwood; Industrial Home School; square 254; Mount Vernon square, for public library, twice; boundary of square 827; corner of square 142; square 1298; alleys in squares 1246, 534, 536, 932, 933, 1028, 1011, 1058, 551, 93; alley at National Theater; Rhode Island avenue in Le Droit Park; Morris road in Buena Vista; Morris street in Meridian Hill; streets in Mattingly tract; Nineteenth street extended; S street in Kall tract; block 5 of Howard University subdivision; Ontario avenue; Hanover place; Newport place; sidewalks of Frederick's subdivision, Anacostia; lines of streets for electric railroad through Le Droit Park and Howard University subdivision; Prospect street; corner of Thirty-second and U streets; corner of Brightwood and Whitney avenues; Connecticut avenue extended in Washington Heights; corner of Cincinnati and Detroit streets, Langdon; block 7 of University Heights subdivision; Rhode Island avenue through Le Droit Park; corner of Maryland avenue and H street; Clark Mills estate.

The following plats were recorded for the District: Changes of alleys in squares 574, 620, 158, 1246, 670, east of 1042, 1298, 698. Also in county records, plats as follows: Minnesota avenue; Sixteenth street and Blagden avenue; dedication of streets in Cleveland Park; extension of S, Decatur, and Twenty-second streets; widening of Nineteenth street; abolition of grade crossings at Deanwood; extension of Rhode Island avenue through Le Droit Park; dedication of streets through Mattingly tract; Shoemaker tract; alley in block 5, Le Droit Park; L'Enfant square; extension of Joliet street; dedication of Columbus avenue; dedication of Linthicum place; change of alleys in square 78, Petworth; dedication of W street in Thompson tract, and the fourth section, highway-extension plans. A copy was made of the official map of the Zoological Park.

The total number of plats made upon the order of the District in the above cases would average three in each, or 252 in all. An exact copy is kept of each map that leaves the office and generally one, sometimes two or more working maps are necessitated. In all about 75 orders were filled for the District, many of them involving several days in their execution. About 300 sketch plats were made for use of owners and builders in obtaining building permits. Probably 200 other sketch plats were made, of which no exact account was kept, to assist private parties in determining their plans of subdivision. The total of plats turned out by the office for all purposes, public and private, is about 3,000, or an increase of 300 over last year, or 10 per cent.

Survey reference points have been secured, before removal of sidewalks, on 85 streets and alleys; 99 reports have been made to the Engineer Commissioner as to

fire, water, and felonious interference until a proper municipal building is  
nite policy has been maintained to concentrate in this office, so far as prac-  
all papers relating to the ownership by the District of real estate and ease-  
erein. I have obtained from the Commissioners orders to record all plats of  
demned for public use, and land condemned for corporation uses under

absence of increase of drafting force, all except the current work of this  
will have to await opportunity to reach it for recording. The subdivisions  
Georgetown are now recorded with subdivisions in the city proper, thus  
ng, since January 1, 1900, the use of a special Georgetown book and simpli-  
rch of records.

arrangement with the collector of taxes, those ordering surveys or subdi-  
t this office may leave (if they so prefer) with the collector the receipts he  
fees paid, thus obviating a return to the surveyor's office. In view of the  
of street cars now passing the city hall, and the distance between this office  
of the Commissioners, this is some relief to ladies and infirm people.

close of the fiscal year practically all current work was up to date, but this  
ible only by the unremitting work of every man in the office, and by the  
of a second field party.

rary bureau card index system is being pushed as rapidly as current work  
n immense number of neatly type-written cards now being in constant use.  
lic prefers the use of cards for the county records and the book index has  
together retired.

ystem enables one at a glance, by turning over a few cards, to run down to  
t subdivision all the ramifications of any lot of an original subdivision, with-  
touching the record books except to look at the one page desired. This is  
save the books very largely.

gress whatever has been made during the year on the most important work  
ing the already existing copies of the older record books of the office. Cur-  
k has kept me incessantly employed, preventing that personal work on these  
important copies which is essential. I can only hope for some time in the  
then a slackness of work will allow their completion. Complete copies have  
ade of all the old "corporation alley plats" which are in a condition of  
tion from long use, and placed in book form. The verification even of this  
for official certification has not been possible from lack of time.

lent copies have been made of the most dilapidated pages of "Coyle's Grades."  
ld again invite your attention to the urgent need of providing photolitho-  
or tracing copies of many of the extremely valuable maps relating to the  
ning of the city now stored in this office. Though crowded with exten-

The entire office force is most faithful and industrious, working cheerfully overtime whenever it is important to complete work. I should be very glad to see as many as possible of these gentlemen transferred to the permanent roll. I wish to express my very hearty appreciation of the services of each and all, without which I should be unable to report as I now do that, so far as the funds available permit, the office is now thoroughly organized to deal with the incessant demands made upon it and to do so in a prompt and businesslike manner. The very nature of the work, intimately associated as it is with the landed interests of the District, demands a mobile force and one sufficient to obtain results desired within a day or two. For every reason I am compelled to ask that every effort be made to secure a sufficient appropriation to run two complete field parties of four men each the entire year and four men in the office for the same time.

This is the least number that can cope with the work now coming in. The present appropriation is but \$1,800 more than five years ago, and the work has more than doubled in that time.

I should also have an extra draftsman, whose duty should be to keep constantly up to date plats showing the exact condition of subdivisions of each city square and important suburban subdivisions. This is possible to obtain now from the card index, so far as suburban subdivisions are concerned, though not, of course, in graphic form.

Under the operation of a recent law, this office has now on file 22 plats of cemeteries within the District, which have been filed within the year.

Not less than one-third of the time of the office force is taken up in answering questions on every imaginable matter germane to the records and to surveys and subdivisions. This is as it should be, as this office is maintained in part by the taxpayers, who should find here every possible facility for the transaction of real estate business.

The number of estimates of cost, made up in triplicate, was 797, an increase of 27 per cent over last year, and the entries of all kinds in the order book, as to various branches of the work of the office, were 922, or 23 per cent more than last year. All things considered, I estimate the total volume of business at 20 per cent greater than last year.

In my estimates for the money desired for the conduct of the office for the next fiscal year I have set forth in detail the urgent need for appropriations to enable this office to make resurveys of Barry farm, of Beatty & Hawkins's addition to Georgetown, and to mark the entire boundary line between Maryland and the District with intermediate stone monuments at all road intersections and salient points, and to replace such as are lost, of the original monuments placed at each mile of the boundary. Also to provide for the relocation of all the corner-stones of the extreme eastern blocks of the city. In all, \$6,500 is asked for for these four items, which are impossible to reach with the present force.

The recent death of Mr. Henry W. Brewer, a surveyor of wide experience, whose work has been done chiefly in Georgetown and the western part of the District, and who was for a very long period the official surveyor of Georgetown, where his dictum as to boundaries was final, has left the property owners of that section in an unfortunate situation as to locations. Doubtless all of his city work and much of his county work will now be thrown into this office, where alone a bonded guaranty can be obtained for the security of building lines. This office is, however, without reliable data on so many of the squares of Georgetown, that although the surveyor is required by law to make any survey called for, it is not fair to him to fail to provide him with all the data possible. To this end I most urgently request that an appropriation be obtained at the coming session of Congress for the purchase of all of Mr. Brewer's valuable survey notes that are found to be of use within the District. They should be temporarily rented by the District and stored in the vault of this office at once, if arrangements can be so made.

Where all have worked so faithfully in the office force, it seems hardly in order to single out any individuals for special recognition, and yet I think that the assistant surveyor, Mr. E. M. Talcott, to whom is now intrusted the most responsible division of the work of the office, the location of all city lots, should be compensated in accord with the extremely conscientious work he is doing, and the risks of serious error he is constantly taking. His work is of a permanent character, building up, square by square, a complete network of the most accurate surveys all over the city, fixing for the entire lifetime of the capital city (as I hope) a rigid and definite basis of action. I think his salary should be fixed by law at \$2,500, instead of \$1,800. The long and valuable services of Mr. J. H. Forsyth, the chief clerk, are well known to the community, and he has, in his untiring zeal to keep the clerical work up to date, given up all his annual leave for the last two years. The record clerk has his division well in hand, and the facilities now afforded the owners and examiners of real estate are

largely due to his intelligent system. The draftsman has the books in excellent, a standard style having been adopted for the record page, producing neat and legible results.

Very respectfully,

HENRY B. LOOKER,  
*Surveyor of the District of Columbia.*

W. LANSING H. BEACH,  
*Corps of Engineers, U. S. A.,*  
*Engineer Commissioner District of Columbia.*  
(through Captain Newcomer.)

## REPORT OF THE SUPERINTENDENT OF PARKING.

WASHINGTON, July, 1900.

SIR: I have the honor to submit the following report of work performed under the supervision of this office during the fiscal year ending June 30, 1900.

### TREES PLANTED.

One thousand one hundred and sixty-seven trees were planted in the city and suburbs, distributed as follows:

Northwest section .....	1,418
Between town and west of Rock Creek .....	203
Northeast section .....	304
East section .....	155
Southwest section .....	87

They consist of the following varieties:

Soft maple ( <i>Acer dasycarpum</i> ) .....	372
Hard maple ( <i>Acer platanoides</i> ) .....	364
Sugar maple ( <i>Acer saccharinum</i> ) .....	419
Brown chestnut ( <i>Æsculus hippocastanum</i> ) .....	2
Black oak ( <i>Quercus palustris</i> ) .....	116
American linden ( <i>Tilia americana</i> ) .....	188
Italian plane ( <i>Platanus orientalis</i> ) .....	453
Boxwood ( <i>Saxifraga adiantifolia</i> ) .....	110
American elm ( <i>Alnus americana</i> ) .....	143

This is 156 less than the number planted during the previous fiscal year, which was 323. I attribute this decrease to the fact that the expenditure because of the storm of August 2, 1899, was about \$2,400, which would have been used largely in planting and trimming. These trees are now in good condition.

One thousand seedlings were transplanted from the seed beds into nursery rows at the District nursery. These were principally red oaks, Norway and sugar maples, honey locusts, negundos, Athenian and Carolina poplars are no longer being used for street planting.

### TREE TRIMMING.

The soft maples were given special attention in this matter. Those in the north-south-east, and some portions of the northwest sections, especially K and M streets, having been gone over and trimmed (quite a number of them severely) and are now in excellent condition.

The scale insects which attacked them so severely a few years ago seem to be gradually disappearing.

The elm trees on the streets have not yet been attacked by the "elm-leaf beetle," a few years ago defoliated quite a number of them, but killed none.

Terpillars, however, appeared on the trees about the beginning of June, particularly on the negundos and lindens, but these have now been cleaned for the present. Owing to the scarcity of money, it has not been practicable to cultivate the young of recent planting to the extent necessary to do them justice.

### TREES REMOVED.

One hundred and fourteen trees were removed from the streets. Of these the removal of many was made necessary because of street alterations—change of width

or grade. The balance being dead—destroyed by worms—or removed at popular request to give place to varieties considered more desirable.

From North Carolina avenue, between First and Second streets SE., were removed 32 Carolina poplars (*Populus angulata*).

From Georgia avenue SE., between Ninth and Tenth streets, were removed 12 aspen poplars (*Populus alba*).

From W street NW., west of Thirteenth street, were removed 50 honey locusts (*Gleditsia triacanthus*).

From L street NW., between Fourteenth and Sixteenth streets, were removed 75 negundos (*Acer negundo*).

From N street NW., between Ninth and Seventeenth streets, were removed 50 negundos (*Acer negundo*).

From H street NW., between Twentieth and Twenty-first streets, were removed 15 negundos (*Acer negundo*).

This last-named variety, "negundo," of which there are about 1,000 remaining, is the least desirable tree on the streets, being unsightly at its best and the first to be attacked by insects, which invariably defoliate it.

The entire removal of this tree and the many "aspen poplars" scattered throughout the city would go a long way in the solution of the caterpillar problem.

During the year no wire netting for the protection of trees from horses was purchased, but the trees in the greater portion of the city were examined and the old wires readjusted to suit their growth.

## DISTRIBUTION OF WORK.

Appropriation for year ending June 30, 1900 .....	\$22,500.00
Emergency fund (removing caterpillars) .....	600.00
Other appropriations .....	192.85
Deposits of individuals, railroad companies, etc .....	202.28

23,495.13

Work at office, sharpening tools, preparing tree straps, etc....	\$638.75
Work at nursery .....	2,276.96
Digging holes and planting trees .....	5,648.45
Trimming trees .....	2,305.54
Cultivation of trees on streets .....	1,085.33
Removing trees .....	1,792.72
Removing debris, trees, etc., caused by storm of August 2 ....	2,360.99
Readjusting tree wires .....	803.57
Care of parkings, mowing, etc .....	940.34
Paving tree spaces .....	780.30
Strapping and restrapping trees .....	276.37
Removing caterpillars .....	1,113.84
Trimming hedges .....	36.20
Removing boxes .....	19.50
Trimming trees for street lamps .....	25.00
Gathering seed .....	12.50
Attending to casualties reported by the police .....	379.49

20,495.85

## Materials:

Lumber for tree boxes, leather straps, tools, nails, soil, etc.. 2,992.28

23,488.13

Balance unexpended ..... 7.00

Number of trees on streets as per last report .....	78,474
Number removed during the year .....	414

78,060

Number of trees planted during the year .....

2,167

Total ..... 80,227

Four foremen were employed on days suitable for work, at \$3 per diem; total, \$2,967.50.

During the year 764 communications that needed a personal inspection of the work requested were received and given the necessary attention.

dred and seventy-eight reports of damaged trees were received from the tan police department (in addition to those of the storm of August 2) and medied as far as possible. fully submitted.

TRUEMAN LANHAM,  
Superintendent of Parking.

ANSING H. BEACH,  
ps of Engineers, U. S. A.,  
Engineer Commissioner District of Columbia.  
gh Captain Newcomer.)

REPORT OF THE INSPECTOR OF ASPHALT AND CEMENTS.

WASHINGTON, September 11, 1900.

6: The work of testing done in this office during the fiscal year ending June 30 is summarized as follows:

Testing.

ements:	
brands 5, samples.....	3, 370
d, brands 15, samples.....	5, 200
	8, 570
d, crude, 6 cargoes, samples.....	41
d, refined, samples.....	6
lez, refined, samples.....	1
ic cements, samples.....	133
um oils.....	41
mixtures.....	145
ineous asphalts.....	3
	370
	19
	2
	3
	13
	204
	3
	3
us, experiments, etc.....	30
	282
	9, 222

HYDRAULIC CEMENTS.

mber of barrels inspected and the average results of tests of each brand of ill be found in the following tables:  
cements.—The 3,370 samples represent 51,431 barrels, of which 2,981 were

Natural cements.

d.	Number of barrels.	Number of samples.	Per cent residue 100-mesh sieve.	Initial set (minutes).	Per cent water used.		Temperature of air and water.	Tensile strength.		
					Neat cement.	2 parts sand.		Neat cement.		2 parts sand, 7 days.
								1 day.	7 days.	
i.....	16,840	1,100	17.8	21.6	82.5	14.7	77.6	129.7	224.3	139.0
i and	600	30	16.0	21.0	80.0	14.0	70.0	165.0	236.5	139.0
d Val-	3,350	300	13.7	23.4	82.0	14.0	76.2	100.2	170.0	114.7
.....	21,024	1,330	17.6	21.0	29.5	13.5	77.8	79.6	156.4	87.1
.....	9,617	610	15.6	16.0	31.8	14.3	77.1	124.4	211.3	133.3

*Portland cements.*—The 5,200 samples of Portland cement represent 49,812 barrels of which 6,105 were rejected.

*Portland cements.*

Brand.	Number of barrels.	Number of samples.	Per cent residue 100-mesh sieve.	Initial set.	Per cent water used.		Temperature of air and water.	Tensile strength.		
					Neat cement.	3 parts sand.		Neat cement.		3 parts sand, 7 days.
								1 day.	7 days.	
				<i>h. m.</i>						
Alpha.....	1	1	7.0	0 5	19.0	10.0	73.0	505.0	763.0	278.0
Atlas.....	4,700	400	12.0	2 50	18.2	8.4	77.6	492.4	740.1	306.8
Climax.....	2	2	2.5	4 30	20.0	10.0	77.0	343.0	546.0	213.0
Dyckerhoff.....	1,500	150	8.0	5 00	22.0	10.0	77.3	249.0	481.0	232.0
Germania.....	6,518	660	6.9	3 00	20.1	9.0	72.5	321.3	560.1	234.4
Kronsborg.....	1	1	21.0	1 30	20.0	10.0	74.0	337.0	471.0	184.0
Lehigh.....	1	1	8.0	5 18	19.0	9.0	72.0	484.0	878.0	297.0
Mannheimer.....	800	80	7.0	3 10	21.0	10.0	80.0	288.0	413.0	234.0
Misburg.....	1	1	6.5	3 00	23.0	11.0	76.0	376.0	515.0	241.0
Nazareth.....	200	20	5.0	5 00	20.0	9.0	70.0	344.0	825.0	343.0
Saylors.....	1	1	3.0	4 00	20.0	10.0	75.0	386.0	969.0	263.0
Star.....	20,640	2,330	8.7	2 35	20.0	9.6	76.5	486.0	702.1	317.4
Tentonia.....	1	1	3.0	4 00	24.0	11.0	70.0	358.0	565.0	262.0
Tollite.....	1	1	0.5	4 00	20.0	10.0	76.0	306.0	448.0	174.0
Vulcanite.....	15,445	1,551	7.5	3 40	20.0	9.3	74.0	327.3	860.9	348.7

LONG-TIME TESTS ON NATURAL AND PORTLAND CEMENTS.

It should be understood that the tests given in the following tables are not supposed to show the relative strength of the different brands, but merely to exhibit the relative gain in strength with age. It can readily be seen by consulting the tables of average tests on cements in this and former reports that some of the samples of cements used in making up these tests are below, while others are above, the average of their respective brands. In collecting these samples we endeavored to get as near an average sample as possible of each brand, by mixing samples taken from a number of barrels:

*Long-time lists.*

Brand.	Per cent water used.		Temperature of—		Tensile strength.							
	Neat cement.	Two parts quartz.	Air.	Water.	Neat.		Two parts standard quartz.					
					1 day.	7 days.	7 days.	14 days.	21 days.	1 month.	2 months.	3 months.
Antietam.....	32	15	89	88	62	168	48	103	110	124	158	182
Black Diamond.....	29	14	80	80	81	162	83	.....	.....	126	185	211
Cedar Cliff.....	33	15	90	90	88	185	85	145	152	195	252	236
Cumberland.....	32	15	90	91	169	218	156	208	290	297	307	354
Cumberland and Potomac.....	32	15	91	91	146	204	188	196	220	225	315	401
Lawrenceville.....	.....	13	70	70	.....	.....	84	102	133	148	206	278
Shepherdstown.....	31	14	91	92	61	145	106	144	161	210	227	285
Potomac.....	30	15	79	79	66	147	62	.....	.....	131	248	353
Union, mixed with 3 parts sand.....	22	10	75	75	94	130	74	98	160	181	194	236
Improved Union, mixed with 3 parts sand.....	21	10	70	68	102	116	95	.....	.....	132	178	182
Round Top.....	32	14	90	90	81	203	122	188	233	255	305	342

## Long-time lists—Continued.

Brand.	Tensile strength.											
	Two parts standard quartz.											
	4 months.	5 months.	6 months.	7 months.	8 months.	9 months.	10 months.	11 months.	1 year.	2 years.	3 years.	4 years.
.....	161	173	185	180	188	203	228	230	231	240	246	228
mond.....	305	306	316	326	316	309	324	316	327	310	.....	.....
.....	256	270	290	309	290	298	304	346	364	384	385	312
ed.....	366	357	350	355	416	406	429	434	438	446	441	424
d and Potomac.....	388	384	397	394	406	388	423	428	436	490	506	514
ille.....	290	293	291	293	290	288	295	293	321	322	298	.....
own.....	283	272	281	305	321	300	301	315	366	356	337	362
.....	299	309	307	320	328	312	311	314	323	.....	.....	.....
ced with 3 parts sand..	240	244	238	257	262	267	272	306	312	364	344	345
Union, mixed with 3	198	226	232	258	276	289	296	331	322	326	283	289
d.....	371	378	387	383	413	428	444	561	515	561	566	514
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	510

Brand.	Per cent water used.		Temperature of—		Tensile strength.							
	Neat cement.		3 parts quartz.		Neat.		3 parts standard quartz.					
	Neat cement.	3 parts quartz.	Air.	Water.	1 day.	7 days.	7 days.	1 month.	2 months.	3 months.	4 months.	.....
.....	21	9	80	80	.....	.....	105	182	310	309	310	310
.....	30	10	70	70	292	335	188	310	290	323	323	385
.....	30	10	90	90	432	768	321	441	441	510	510	519
Henry.....	30	10	70	70	149	546	159	188	229	277	300	300
.....	21	10	70	70	345	566	164	175	192	236	257	257
.....	30	10	68	65	188	159	205	205	255	240	286	286
.....	21	11	72	72	160	495	230	275	275	267	296	296
.....	30	10	68	65	295	571	205	244	251	277	301	301
.....	30	9	78	78	296	657	159	203	286	301	323	323
.....	30	10	68	68	.....	496	158	258	281	356	372	372
er.....	30	10	78	78	329	525	193	226	306	329	335	335
.....	30	10	70	68	407	415	181	257	305	319	315	315
.....	30	8	82	82	201	461	135	156	205	203	254	254
lica, 1 to 1.....	22	10	80	80	266	541	216	236	288	319	336	336
lica, 1 to 6.....	22	10	80	80	21	97	46	69	96	94	108	108
.....	18	9	74	74	.....	.....	211	276	291	297	284	284

Brand.	Tensile strength.											
	3 parts standard quartz.											
	5 months.	6 months.	7 months.	8 months.	9 months.	10 months.	11 months.	1 year.	2 years.	3 years.	4 years.	5 years.
.....	296	327	346	284	295	319	345	350	311	386	387	.....
.....	380	390	381	379	383	374	377	366	371	359	346	375
.....	529	598	538	515	501	560	572	546	523	496	491	499
Henry.....	329	319	316	328	332	335	331	332	335	320	303	309
.....	293	298	315	315	332	340	345	323	370	352	390	384
.....	301	341	351	362	360	375	402	394	417	401	371	363
.....	329	325	351	296	304	300	308	327	342	336	328	332
.....	315	315	311	317	335	340	348	354	355	317	374	422
.....	329	314	341	356	345	310	308	347	325	306	367	.....
.....	350	341	314	337	358	350	384	396	442	388	.....	.....
er.....	323	343	342	352	321	341	316	336	334	336	343	.....
.....	322	343	250	275	303	329	339	329	348	310	334	354
.....	277	289	276	264	279	295	282	279	260	266	279	.....
lica, 1 to 1.....	364	384	377	377	385	394	387	379	366	353	291	.....
lica, 1 to 6.....	127	130	135	146	168	187	183	192	90	81	106	.....
.....	306	331	294	315	308	313	314	329	336	.....	.....	.....

## WELL WATER.

Of the 201 analyses made for the water department during the past year, 146 were of water from the shallow wells and 55 from the deep drilled wells. Of the shallow wells, 26 analyses indicated that the wells were bad and unfit for use, 107 showed the water to be suspicious of pollution, while 13 showed the water to be good.

Of the drilled wells, 3 were suspicious, 52 good, and no bad.

## ASPHALT PAVING.

Contracts to lay asphalt pavements for the past fiscal year were awarded to the Ayers Asphalt Paving Company, of Zanesville, Ohio, and Cranford Paving Company, of Washington, D. C. Bermudez asphalt was used in the work of the Ayers Company.

*Bermudez asphalt.*—The Bermudez asphalt used during the past year was very non-uniform in quality and in some cases was even poorer than that of last year.

*Trinidad asphalt.*—Trinidad asphalt has been used during the past year by the Cranford Paving Company in their work of laying, resurfacing, and repairing pavements.

This asphalt, as formerly, has been imported by the Barber Asphalt Paving Company in the crude state and refined and manufactured into paving cement by them for the Cranford Company.

During the year 41 samples of crude Trinidad asphalt have been received, representing 6 cargoes. The asphalt received has been markedly uniform in composition, as in former years, the maximum, minimum, and average being, respectively, 54.90, 52.22, and 53.43 per cent bitumen soluble in carbon disulphide.

*Petroleum residuum.*—The residuum oils received during the year for use as fluxes for asphalts are 41 in all, assigned as follows: Ayers Asphalt Paving Company, 4; Barber Asphalt Paving Company, 27; Cranford Paving Company, 3; Washington Asphalt Block and Tile Company, 4; special, 3. Of the total number received, 2 were rejected.

*Asphalt cements.*—The results of the tests made on the samples of asphalt cement received from the several paving companies will be found in the following table:

	Number of samples.	Penetrations.		
		Maximum.	Minimum.	Average.
Ayers Asphalt Paving Co. ....	44	60	32	47.8
Barber Asphalt Paving Co. ....	13	53	37	47.0
Cranford Paving Co. ....	62	44	33	37.9
Washington Asphalt Block and Tile Co. ....	12	22	14	16.8

During the past year a good opportunity was offered to compare the results of penetrations taken at the paving yard and laboratory with machines made on the same general principle and using the same standard. The penetrations taken at the yard were reported at the end of each week, while the samples were sent up to the laboratory every day or two, so that in all cases the penetration of the sample was taken in the laboratory before the results of the yard test were known. In the following table will be found the laboratory test and yard test compared:

*Penetrations of asphalt cement used by the Ayers Asphalt Paving Company.*

Date.	Penetrations.		Date.	Penetrations.	
	Office.	Yard.		Office.	Yard.
November 27 .....	55	53	December 13 .....	52	50
November 28 .....	46	48	December 14 .....	53	54
November 29 .....	58	55	December 16 .....	56	58
December 1 .....	42	44	December 18 .....	54	53
December 2 .....	42	44	December 19 .....	40	40
December 4 .....	50	51	January 10 .....	56	56
December 6 .....	48	49	January 11 .....	48	48
December 7 .....	49	48	January 12 .....	55	53
December 8 .....	48	50	January 13 .....	48	47

*surface mixtures.*—During the past year 114 samples were submitted by the paving companies. The following table shows the maximum, minimum, and average per cent bitumen found in the surface mixtures, and also the average mesh of the sands used during the year:

	Ayers Asphalt Paving Co.	Barber Asphalt Paving Co.	Cranford Paving Co.
samples.....	31	22	61
per cent bitumen.....	10.4	10.5	10.6
per cent bitumen.....	9.5	9.8	9.7
per cent bitumen.....	12.8	11.7	11.9
per cent retained on sieves having—			
1/8 per linear inch.....	1.75	10.00	6.5
1/4 per linear inch.....	30.25	28.00	32.00
3/8 per linear inch.....	23.50	22.50	25.00
1/2 per linear inch.....	18.75	14.00	14.00
3/4 per linear inch.....	10.25	6.50	6.50
100 mesh per linear inch.....	15.50	18.00	16.00

*bituminous asphalts.*—Under this heading are included two asphaltic sandstones from Trinidad and Bermudez asphalts, and one sample of asphaltic sand for the Navy Department.

#### INSPECTION OF ASPHALT PAVEMENTS IN WASHINGTON.

Special attention is given here to inspection of the manufacture and laying of asphalt pavements than in any other city in the country, a description of the methods employed may be of interest, and as there are certain technical terms used in asphalt business that may not be familiar to all it will be well to define them in connection with this report.

*Refined asphalt* is an asphalt that has been partially prepared for paving purposes. The case of Trinidad and Bermudez asphalts this refining consists in nothing more than drying out of water that is associated with these asphalts in their crude state. Trinidad and Bermudez are sometimes spoken of as dried asphalt.

*Asphalt cement* is any material that has the property of softening refined asphalt when mixed thus producing a paving cement. It is generally a heavy oil, and in Washington is petroleum residuum.

*Asphalt cement* is a bituminous material used as the matrix of an asphalt pavement. It is usually a refined asphalt softened with a flux. It is often referred to

as *bituminous concrete* composed of broken stone and sometimes gravel, together with asphalt cement. It is the portion of the pavement laid between the concrete base and the wearing surface, acting as a binder between the two.

*Surface mixture*: The mixture of sand and asphalt cement which is laid as the top or upper surface of the pavement. It is also spoken of as asphalt surface mixture, topping mixture, mixture, and mix.

For that the methods and reasons for the different branches in the inspection of asphalt pavement better understood, a description of the various materials entering into the composition of the pavement and the methods employed in their treatment will not be out of place here, and may aid in making clearer the reason for the different methods in the inspection.

*Trinidad and Bermudez asphalts.*—There have been but two asphalts used in pavements in the District of Columbia during my experience here—the Trinidad Lake and the Bermudez.

*Trinidad Lake asphalt* is brought here in its crude state, in bulk, direct from the Trinidad Lake by the Barber Asphalt Paving Company. The refining of this asphalt, done by that company, consists in nothing more than drying out the water, which makes up nearly a third of the crude asphalt. This is accomplished in stills the same plan as double-flue boilers. The stills are put up in a battery of capacity of each one being 50 tons. A slow fire is used and the asphalt reaches a temperature of above 375° F. To assist in the refining, and also to keep the molten mass agitated so that the earthy impurities of the asphalt will not settle, several jets of air are blown into the asphalt. The impurities here spoken of are of a mineral matter constituting about 33 per cent of the refined and 10 per cent of the crude asphalt. This organic matter is commonly known as woody material, such as twigs, roots of trees, grass, etc., and bituminous material that has been transformed into an insoluble state.

The oxidation of the asphalt by means of air has been criticised by some authorities as being detrimental to the asphalt by oxidizing it and thus increasing the amount

of so-called asphaltene. I have examined into the effect of this blowing air into the hot asphalt and have been unable to detect any marked difference, either chemically or physically, between the asphalt before being blown and after having been blown for a moderate time. I do not mean to imply that a long continuous agitation with air would not produce a change, but that to the extent it is done here it is not detrimental.

When all the water has been removed from the asphalt and it is what is called refined, it is oiled into the paving cement by the addition of petroleum residuum oil. This is done in the refining still and while the asphalt is in a molten condition, at a temperature of about 325° F. The residuum oil is heated to a temperature of about 150° F. before adding to the asphalt. This oiled asphalt, or asphalt cement, is heated for from 18 to 24 hours with air agitation to insure a thorough incorporation of the oil and the asphalt. After this it is drawn off into storage tanks or barreled to await use.

The Bermudez asphalt is received here in a refined state, usually in barrels. Shipping this asphalt in jute bags was attempted at one time, but the removal of the bagging from the asphalt was such a nuisance that the method can be considered impractical.

Bermudez refined gives on analysis an average of 94.3 per cent with a maximum of 95 per cent and a minimum of 92.94 per cent of bitumen soluble in carbon disulphid.

The quality of the bitumen in this asphalt is very variable, even in the same shipment. This nonuniformity is well illustrated by comparing the amount of residuum oil used to produce paving cements of the same degree of penetration or softness. In the same shipment of refined asphalt anywhere from 17 to 23 pounds of oil were used to soften the refined into paving cement of 52 penetration. On one day two stills were oiled side by side with 18 pounds of oil to the 100 pounds of asphalt. One still produced a cement of 43 penetration, while the other one of 52 penetration. It is evident from this that formulas are useless in the handling of this asphalt if uniform results are desired in the pavement.

Judging from the purity of the Bermudez asphalt, as indicated by the per cent bitumen soluble in carbon disulphid, one would naturally suppose that agitation was unnecessary, but the bitumens which make up the total bitumen soluble in carbon disulphid being insoluble one in another, there is a considerable subsidence of the heavier bitumens if agitation is not resorted to. These heavy bitumens subsiding form at first a granular gummy layer on the bottom of the kettle which, if allowed to remain, is soon transformed by the heat into the toughest kind of coke.

From a theoretical point of view it would be natural to suppose that a bitumen composed as this would be very undesirable to use as a cementing material in a pavement, but experience has developed no defects that can be traced to this cause; in fact, in all our experience with Bermudez asphalt, which extends over a period of eight years, we have had practically no failure of Bermudez pavement and no indications that any will develop that can be traced to a defect in the asphalt.

The refined Bermudez is made into the paving cement by melting it in large kettles and fluxing with residuum in a similar manner to that pursued in the production of Trinidad asphalt cement.

*Sands.*—Under this heading I include all the mineral ingredients which enter into the composition of the wearing surface of the pavement. The sands, strictly speaking, supplied for paving in this city are of various grades, and it is but seldom that any one sand is found that is suitable by itself for paving. This necessitates the mixing of two more sands, which requires considerable care to produce a sand that will run uniform from day to day.

For some inexplicable reason the fine sands—that is, those containing considerable material that passes the 80-mesh screen—are very hard to procure. So, to make up the required amount of fine, dust from the stone crushers is used. The use of much of this however, is discouraged, as this dust naturally contains the poorest portions of the rock from which it is crushed, and, as would be expected, its grains are rotten and fractured and are liable to break in the pavement.

It is always desirable to have some limestone dust in the mixture, as it has a property of toughening the asphalt cement and making the pavement more impervious to water. At one time I was of the opinion that all fine mineral matter, whether quartz, granite, fine sand, or limestone, had the same property when contained in a paving mixture, and that one was as good as another, but I am now thoroughly convinced that limestone dust acts entirely different from hard mineral dusts, and that it not only fills up the voids but has an absorbent property that toughens the asphalt cement. A marked difference can be noted, especially in mastics, between the action of limestone dust and granite dust. Powdered marls, infusorial earth, and dust from soft noncrystalline rocks act similarly to the limestone in this respect.

*ter stone.*—The stone most commonly used is obtained by crushing the Potomac so that it will all pass a 1½-inch screen. As this stone crushes with a considerable dust, a small portion of the dust is removed, otherwise it is used just as it from the crusher. To this stone is also added the coarse material screened for the wearing-surface sand.

Our practice here to use an aggregate in the binder that is graded from coarse to fine, as we find with such material that a soft asphalt cement can be used and yet make a tough, compact binder that will have, after rolling, a honeycombed surface. We are now giving a short description of the various materials that go to make up the various parts of the asphalt pavement, the next step is the proper mixing and grading of the material to produce the binder and wearing surface.

The binder is made by mixing the binder stone, just described, with asphaltic cement in such proportion that the finished binder contains about 5 per cent of asphalt cement. The asphalt cement used in the binder is much softer than that used in the wearing-surface mixture. The advantage of this will be discussed later on. In the case of the standard asphalt the cement is made of a consistency of 70 to 80 penetration. To produce this, 28 to 39 pounds of residuum oil are used to flux 100 pounds of refined asphalt into cement. When Bermudez asphalt is used the cement is of the consistency of 80 to 90 penetration, which requires anywhere from 25 to 35 pounds of residuum oil to the 100 pounds of refined Bermudez, depending on the quality of the refined.

The binder stone is passed through heating drums where it is heated to a temperature of 300° F. The asphalt cement is melted and kept at a temperature of 300° to 325° in a tank from which it is either drawn off or dipped, as the case may be, into a mixer, where it is thoroughly incorporated with the heated stone. After being thoroughly mixed the binder is dumped from the mixer into the wagon. This operation takes about three minutes in the ordinary mixer. It is impossible to establish an exact formula for the amount of asphalt cement to add to each batch, owing to the variation of the stone, and the only rule to follow is to watch the material in the mixer and keep adding cement until each stone is completely coated with it.

The binder should look glassy, and each stone should be entirely covered with a coating of cement. There should be no appearance of any excess of cement in any portion of the binder. It must not appear dull, although a binder will sometimes present a dull appearance when viewed from a distance, caused by the presence of a considerable dust. On close examination, however, the stone will be found coated, but will have a rough appearance, due to the fine particles in the cement. It is a mistaken idea possessed by some that the binder stone should be screened and be free from all fine material. When such a binder is laid the stone in it is only to be cemented at the point of contact, which is a very small area in most cases, especially where the stones are angular and all of one size. Such a binder is unreliable, and the stones are liable to shift their position from traffic passing over the pavement. It is also necessary with stone free from fine material to use a harder cement than otherwise, so as to make a sufficiently firm bond between the stones. In my opinion that a very soft cement in the binder is an advantage, as it prevents to a certain extent, the drying out or hardening of the wearing surface. With a cement that is graded from coarse to fine, and it can even contain considerable fine, a substantial binder can be made with a soft cement, and still be sufficiently tough to admit of a keying into it of the wearing surface.

A point will naturally be raised that a binder containing fine stone will take more asphalt cement, owing to the greater surface area, than a screened stone binder, and thus be more expensive. This is true, but not to so great an extent as would appear, for the asphalt cement being so much softer, its coating on the stones is not so thick as in the case where a harder cement is used.

*Wearing surface.*—As this is the portion of the pavement that is directly subjected to the wearing of traffic and the influence of the weather, it is very essential that the greatest care should be exercised in its manufacture and laying, not alone in the selection of the materials, but in the keeping them uniform and uniform handling. The pavement seldom, if ever, goes to pieces as a whole, but starts in some one place, separating from it. That place is the weakest point in the pavement and could be corrected if the materials and work were absolutely uniform throughout. Of course it is an impossibility, but with good materials the man that treats them most uniformly is the one that will produce the best pavement.

The asphalt wearing surface is made by mixing heated sand with melted asphalt cement. The sand used, as I have before mentioned, is generally composed of a mixture of two or more sands and sometimes stone dust. This mixing is done while the sands are still moist from the bank and can be accomplished with little care, as

wet sand does not tend to separate. The sand of the desired composition obtained by this mixing is then passed through revolving heating drums and heated to a temperature of about 330° F., after which it is passed through a screen that takes out all material coarser than a 10-mesh. It is then conveyed to a sand bin, from which it can be drawn into the measuring box. After the sand becomes dried, its handling becomes a much different problem than the handling of wet sand, and great care and forethought must be exercised to prevent its separating itself. An illustration of this which is familiar to everyone is, when dry sand falls, forming a conical pile the coarse grains roll down the sides of the pile, leaving the fine in the center and top of the pile. It is now impossible to get samples from different parts of this pile that will be the same in mesh composition.

The asphalt cement for the wearing surface should be, if Trinidad, for ordinary work, 45 penetration; if Bermudez, it should be 55 penetration. It should be kept in the supply tank at a temperature of about 310° F., and constantly agitated. Thorough agitation here is very essential to prevent any subsidence that might take place, so as to keep the composition of the cement uniform.

As asphalt cement when kept at a high temperature slowly hardens by evaporation and oxidation, it is important that the temperature in the dipping or supply tank be kept as low as practicable, and after the cement has been subjected to a prolonged heating it should be examined and a proper quantity of residuum oil added to bring it to its original consistency.

The hot sand, which will now have a temperature of about 325° F., is drawn from the bin into the measuring box, where it is either struck off with a straightedge or weighed, as the case may be. Into this box is also added the powdered limestone while the sand is running in, so as to get a slight distribution. The sand is then run into the mechanical mixer, where it is mixed for about half a minute to insure uniformity throughout. A measured amount of molten asphalt cement of a temperature of about 310° F. is then added to the sand in the mixer and the whole mixed for longer than two minutes, but not over five minutes, when it is dumped into a cart and is ready for the street. The temperature of the mixture as it falls into the cart is generally 300° F. About 20° F. is lost in temperature in hauling the mixture to the street to a distance of a mile, with the atmospheric temperature 60° F.

*Laying of the pavement.*—Asphalt pavement of the types that are being laid in this city are composed of three distinct parts, the base, binder, and wearing surface.

The base is usually constructed of concrete made of 1 part natural cement, 2 parts sand, 2 parts gravel, and 3 parts stone laid to the depth of 6 inches, and finished with its surface parallel to the grade of the pavement. If a base with these proportions is thoroughly mixed and properly laid, it should give a fairly rough surface, which is very desirable so that the binder will key into it, thus minimizing the possibility of the pavement being shoved by traffic.

An old cobble, granite block, macadam, or any old pavement that has been well settled makes very good base, and all such that have been so utilized here have proved entirely satisfactory. In the case of cobble or granite block pavements the surface is prepared by cleaning out the joints and filling all depressions with broken stone, which are sprinkled with asphalt cement to make them more rigid and give a surface that the binder will the better adhere to.

The macadam pavement is prepared by thoroughly cleaning and removing all soft material and spreading over the surface a layer of broken stone, which is sprinkled with the asphalt cement as described above.

When an old asphalt pavement is utilized for a base and it is desired to lay the binder directly on it, the surface should be gone over with a pick to roughen it, thus giving a better surface for the binder to adhere to.

The binder, which is brought from the paving yard in carts, is spread over the finished base, of whatever character it may be, and raked to an even depth of 2 inches, after which it is gone over with a steam roller until it is thoroughly compressed.

To prevent the binder from adhering to the roller, jets of water are so arranged that while in motion the roller is sprayed.

The binder when completed should present a surface that is markedly honey-combed. It should at the same time be so firm that it will stand hauling over without being displaced. It should, as a general rule, appear glossy, but, as before explained, it sometimes has a dull appearance, owing to the presence of considerable fine material.

It sometimes occurs, owing to the binder being too rich, that the cement will settle to the bottom of the cart while hauling to the street. When this material has been spread it will appear as a rich place in the surface of the binder, and care must be taken that all such places are cut out and discarded or they will cause a softening of the wearing surface and subsequent failure of the pavement at that place.

binder appears dull and on laying the stones show no tendency to adhere, the binder should be removed and replaced by good material.

*Wearing surface.*—The surface of the binder should be swept as clean as possible before laying the wearing surface. This is very important, as any foreign material on the binder will prevent thorough adhesion of the surface mixture to the binder. The asphalt mixture which composes the wearing surface is spread and raked over to the binder to an even depth of 2½ inches.

The evenness of the finished surface of the pavement depends on the skill and judgment exercised in this raking, it should be done with the greatest care. Care should also be taken that all the material dumped from the cart is thoroughly loosened either with the rakes or shovels. This is necessary, as the jolting which occurs when the mixture is being conveyed to the street causes that portion of the mixture at the bottom of the cart to become more compact.

After the material has been uniformly spread with the hot rakes, it is gone over with a small cold hand roller weighing about 1,200 pounds.

The roller is prevented from adhering to the hot mixture by a slight oiling of its surface. This oiling is done as the roller is drawn back off of the fresh material by rubbing over its surface with a piece of oily waste. Care must be taken not to apply an excess of oil as it will have a softening action on the surface of the pavement. After being rolled with the small roller, finely ground mineral dust is spread over the surface by sweeping.

This is done principally to prevent the adhering of the material to the heavy finishing roller. The pavement is then rolled with a 5-ton roller. This rolling is continued for five hours for every 1,000 square yards of pavement.

Great skill and care is necessary in this rolling to procure a good surface to the pavement, and in this, as well as all branches of the process of manufacture and laying of the pavement, the whole general plan of operation is very simple, but there are many little details that must be carried out with care to insure the best of results. In the preceding description of the laying of the pavement I have made no mention of the use of hot irons. The use of these irons, as well as the heated shell roller, is discouraged as much as possible, for if the raking is done expeditiously and at the same time with care, and the mixture is hot, they are entirely useless; on the other hand, they are detrimental to the pavement as it is impossible to always have them at a temperature that they will not overheat if not burn the surface of the pavement. I have never known a pavement on which they were not used to scale.

Joints between the pavement and curb, as well as those between the new pavement and old, are closed by tamping with hot tampers.

Having now given a general description of the methods used, and outlined the general plan of manufacture and the laying of the pavement, I will proceed to the final operation.

*Inspection at the paving yard.*—This is done by a man kept there exclusively for the purpose, and he is on duty at all times that the plant is in operation. He inspects every cargo or shipment of stone received for the binder, passing or rejecting it according to its quality. He inspects all sands received, making a sifting for its composition on each shipment, and submits a sample to the laboratory if it is of new quality. Samples of dried sand are taken several times a day, depending on circumstances, to represent what is actually used in the paving mixture, and he makes a complaint to the superintendent of the yard if he finds the sand not running uniformly. He makes the penetration test on one sample of asphalt cement from each tank or still which is oiled. If a still lasts more than one day, a sample is taken from it each day.

A sample of asphalt cement is sent to the laboratory each day to act as a check on the penetration test at the yard. He takes the temperature of the asphalt cement, and of the finished mixture in the cart at intervals during the day.

General inspection is made of the handling of all material received and all material leaves the yard for the street. Note is made of all proportions used in the mixture of material—such as the quantity of the oil used in fluxing the refined into asphalt; the proportion of sand, dust, and asphalt cement which go to make up the paving mixture. Note is also made of the maximum and minimum temperature recorded each day of the sand, asphalt cement, and finished paving mixture; also of the temperature of the refined asphalt and oil when they are mixed, producing the asphalt cement.

He sends into the office laboratory samples representing the average of each day's unloading of the crude asphalt or refined asphalt received at the paving yard; and when the crude is refined, a sample representing the first still on each cargo; samples of each tank car of residuum received and of each new lot of limestone dust received.

When a paving yard is running on anything but minor repair work, samples of asphalt cement and of surface mixture are sent daily.

Another inspector is detailed on the street work, and must be at his post at all times while any work is being performed. It is his duty to see that the specifications are carried out, and that the materials are of the proper temperature when received.

*The office and laboratory.*—In the office a record is kept of each street paved, copying for each day's work from the results and notes given in the yard inspector's report. Record is also made of the analysis of each day's surface mixture and of the serial number of the crude and refined asphalt and the residuum oil, so that by turning to the record books the analysis and history of all materials which enter into the pavement can be found. Note is also made of the weather, giving temperature, direction and force of wind, and condition of weather. It may be interesting here to note the effect different conditions of weather have on the laying of a pavement if the greatest care is not exercised. Of course when the temperature is moderate and there is no wind no bad results can be traced to this cause; but if the temperature is low with a wind blowing, and the pavement is being laid on a street exposed to the sweep of the wind, care is necessary to prevent the hot paving mixture from chilling before it can be properly compressed, or the result will be what is called a spongy surface. This necessitates the use of hot smoothing irons, which, as before mentioned, are liable to cause scaling. The danger of this resulting actually depends on the degree of cold, the velocity of the wind, and whether the street is so situated that it is unprotected from the force of the wind. We have not been troubled with this defect for over four years to my knowledge, and yet we have laid pavement in that time with the thermometer down to zero, with a haul of  $1\frac{1}{2}$  miles from the yard to the street. This speaks well for careful work in keeping the temperature of the mixture well up and of handling on the street.

In the laboratory the samples of crude asphalt are examined by analyzing to ascertain the per cent bitumen soluble in carbon disulphid.

This examination is of no general value in regulating the composition of the paving mixture, as is the examination of the refined, and knowing the quantity of oil used in making the paving cement is a more direct check; but it is made as an observation on the uniformity of the crude asphalt.

The process followed is as follows: Samples of crude asphalt are ground quite fine and dried in a hot oven for two hours at  $225^{\circ}$  F. This removes practically all the water, and in the case of Trinidad only a fraction of a per cent of light oil, and is a sufficiently accurate method for practical purposes. The dried samples are then crushed and about 3 grams of each are weighed in tared test tubes (8 inches long by 1 inch in diameter), the tare of which has been previously ascertained. The tube containing the substance is then filled to within  $1\frac{1}{2}$  inches of the top with carbon disulphid and allowed to stand for a few minutes. Then the tube is tightly corked with a good sound cork. It is shaken vigorously until no asphalt can be seen adhering to the bottom. Care should be taken while shaking to keep one finger on the cork to prevent its being blown out. The tube should then be put away in an upright position and not disturbed in the slightest way for two days, after which the carbon disulphid is decanted off into a small bottle. As much of the solvent should be poured off as is possible without losing any of the residue. The tube is again filled and shaken as before, and put away for two days more. After the liquid has been carefully decanted the second time, the tube, with the residue, is dried at a low temperature, and then  $250^{\circ}$  F. After cooling it is weighed. As there is always a small portion of the residue poured off in the solution with the bitumen this solution must be evaporated and the bitumen burned off in a platinum dish and the weight of the residue added to that in the tube. The weight of the substance taken, less the sum of these two weights, is the weight of the bitumen extracted, from which can be calculated the per cent bitumen.

Refined asphalts are ordinarily only examined for the per cent bitumen they contain. Knowing their composition and the amount of oil used to flux them into the paving cement, the per cent bitumen of the cement can be readily determined. This means of ascertaining the per cent bitumen of the cement is preferable to a direct determination on the cement itself, as a better average sample of the refined can be obtained.

The per cent bitumen in the refined is determined as given in the crude asphalt except no drying is necessary. When a shipment of refined asphalt varies from that

used it is examined still further to ascertain the quantity of flux required into a paving cement of the proper degree of softness.

done by first determining the penetration of the new refined, thus determining whether it is harder or softer than a sample of refined with which you are

found harder more flux will be required; if softer, less is necessary. One gram of the refined asphalt, to be examined, and a quantity of flux, judged proper amount from the examination of the refined, are melted together roughly, but as expeditiously as possible, incorporated at a temperature of 77°. The resulting cement is then cooled to 77° and its softness determined by pen. If not of the required penetration, more oil or refined asphalt is added, as may require, and the cement again thoroughly incorporated at 300° F.,

the penetration of this cement, along with the former one, and knowing the flux refined or flux which produced this difference in penetration, the required flux can be calculated that will produce a cement approximating the penetration desired.

In making this test about the same weights should be used each time and a standard temperature and time to heat the cements established, so that tests made at different times will be comparable. An ordinary cup stamped from one piece of tin is convenient to use for these cement tests.

The test is made so as to aid in determining approximately the quantity of flux required with the refined at the paving yard. I say approximately because the results obtained in the laboratory on a small scale are never exactly in accord with practice. The proportion of refined to flux being the same, the laboratory results always a few points harder than the one made on the large scale.

—As residuums from the Eastern petroleum oils are used here exclusively for the following remarks are only applicable to them, and before proceeding with testing it may be well to look into the rôle that the flux plays in the manufacture of the pavement and how its characteristics influence the physical properties of the paving cement. The flux being composed of the lightest and the most volatile which enter into the cement, it is desirable that the per cent of material which would volatilize at the maximum temperature ever attained in the course of the manufacture of the pavement be determined, and that the per cent of these volatile oils be but small. On the other hand, in the case of residuum, it should not be composed of too heavy oils, for then too much of it would be required to be refined into the cement. Much residuum is undesirable in a paving cement, for the properties in it which are communicated to a certain extent to the asphalt made therewith.

This subject was discussed at length from a theoretical point of view in my report as Engineer Commissioner for the year ending June, 1898. I have since done considerable work comparing the physical properties of asphalt cements made with different fluxes, and have proven the theoretical deduction to be correct up to a certain point, that is, cements made containing small quantities of residuum, 10 per cent or less, differ but slightly, if any, from cements made with the best asphalt fluxes. In the case of Bermudez asphalt cement the residuum does so nearly as well as any other that there is practically no necessity for the use of a better. With the best asphalt cement the case is different. Too much residuum is necessary to make a cement of the proper softness. In the work here harder cement is used than is deemed the most desirable, so as not to introduce any more petroleum residuum. A more detailed discussion of this subject will be made at a later date.

It is desirable that the residuum should not contain too large a quantity of crystalline paraffin, for these crystals at ordinary temperatures are as so much inert solid but as soon as their melting point is reached they suddenly liquify, acting as so much additional flux, thus producing the property in the cement of being susceptible to change in temperature.

The flash point is taken of the residuum not alone to determine the safety with which it can be handled, but it also indicates whether the residuum is going to lose much of its softness on heating. This test is made in a New York State oil tester.

Flash point is an indication of how much residuum is necessary to flux the asphalt. It is taken by direct weight at ordinary temperature and correction made for bringing it to 60° F.

A microscopic examination is made of the residuum when received, both by transmitted and polarized light. With the transmitted light note is made of the amount of the insoluble particles floating in the oil. With polarized light the quantity and character of the paraffin crystals are noted. When the residuum has cooled after having made the flash test, it is again examined with the microscope and

note again made of the character and quantity of the paraffin. This heating and slow cooling always develops more paraffin in the oil; in some cases much more than others.

The test to determine the per cent volatile at high temperature is made by subjecting 50 grams of the oil to a temperature of 400° F. for thirty hours in a short-necked retort, which is hung in an asbestos, jacketed, copper receptacle so constructed that only the neck protrudes, thus insuring a uniform heat to all parts of the retort. Care must be taken that the retort is so hung that the neck slants outward, thus preventing oils which may condense in the neck from flowing back into the retort.

Note should be made of the character of the residue left in the retort after this heating, whether it is liquid or solid, at 75° F. If solid, whether it is coarsely crystalline or not, and at what temperature it melts. Whether it has a ring of coke round the top of the residue or coke in the bottom of the retort. The most desirable residuum is the one that is least changed in its physical properties from what it was originally by this heating and that loses between 2 and 6 per cent.

A test is also made to determine the fluxing power of the residuum. This is done by melting 100 grams of a standard sample of the refined asphalt with which it is to be used with 20 grams of the residuum under examination as described under the refined asphalt testing. (The 20 grams here refers to its use with Bermudez and Trinidad refined.) Penetration is taken of the resulting cement at 77° and 100° F.

The asphalt cement samples submitted by the paving yard inspector are usually only tested for their penetration merely, as a check on the inspector's penetration taken at the yard, unless we are not familiar with the refined or flux of which it is composed.

A comparison is given of the penetration obtained at the yard and laboratory in the first part of this report under asphalt cements examined during the year. When you consider that the penetration machine was used by a man who had no previous experience in any way with asphalts, the results obtained bear evidence of the usefulness of this test at the paving yard, at a time when any error in the consistency of the cement may be remedied before it is used in the pavement.

Asphalt surface mixtures are examined for the per cent bitumen they contain, not as a guide for the paving yard, as the analysis takes too long to be of any value in this way, but for data to put on record and also to act as a check on the gauging of material at the yard. The analysis of the mixture for the bitumen contents is made in the same way as the dried and refined.

The residue of sand and mineral matter left after the extraction of the bitumen from each sample is saved and every three months a sifting is made of the combined residues from the mixture received during that time. This is recorded as the average sand for the three past months, and an average of the sifting at the yard for the same interval of time should correspond closely with these results, after having made allowance for the fine residual material derived from the asphalt.

The samples of new sand submitted to the office are sifted through a series of sieves (20, 40, 60, 80, 100 mesh per linear inch) and the percentage determined of the material retained on each sieve and what passes the 100-mesh sieve. The sand is then examined under the microscope and note made of whether the grains are clean or coated with loam or clay, the shape of the grains whether rounded, round angular, sharp angular, or flat; whether the surface of the grains is smooth and polished or rough and pitted; whether they are of soft or hard material. The character of the fine material should be noted; whether it is crystalline and hard and nonabsorbent in character like quartz or soft and absorbent like soft marl or limestone.

Besides performing this routine work in the laboratory experiments are carried on looking toward improvement in the methods of testing asphalts, and also the improving of the various materials in use.

A. W. Dow,

*Inspector of Asphalt and Cement.*

Capt. LANSING H. BEACH,

*Corps of Engineers, U. S. A.,*

*Engineer Commissioner District of Columbia.*

## REPORT OF THE ASSISTANT ENGINEER IN CHARGE OF STREET EXTENSIONS.

WASHINGTON, August 20, 1900.

SIR: I have the honor to submit the following report of the operations of this department for the fiscal year ending June 30, 1900:

Work during the first part of the past year consisted in perfecting the highway plan of the fourth section. This section, as noted in former reports, consists of that part of the District of Columbia south and east of the Anacostia River, comprising over 9,000 acres of land. Considerable study had been made on this section in previous years, but a number of important changes were added during the year and the final plan was so acceptable to interested parties that no objections were filed with the highway commission against these maps. This plan was platted in 22 maps, to a scale of 1 inch to 200 feet, and 1 map to a scale of 1 inch to 400 feet, accompanied with title-page, and explanation. The plan was recorded in the office of the surveyor of the District of Columbia, May 16, 1900, marking a complete and permanent system of highway plans for the entire District of Columbia. These plans, and other data relating thereto, are now on record in the office of the surveyor, and it is intended that future matter, like the donation of streets, and subdividing of land in accordance with highway plans, will be carried out by the surveyor's office, from time to time, as matters of real estate may require. After the fourth section a portion of the force of my office was transferred to the surveyor's office, and the parties so transferred are intimately acquainted with details of work done during the past years relating to these plans.

Following the work on the fourth-section plans a map has been prepared covering the entire District of Columbia, showing the city streets, with block numbers, the subdivisions in the suburbs, property lines, with names of owners of land, and the permanent system of highways covering the entire District. This map has been lithographed to a scale of 1 inch to 1,000 feet, copies being made only for office use. There has also been prepared on a scale of 1 inch to 400 feet a contour map of the fourth section, embodying the present and proposed plan of streets. This has been lithographed to a scale of 1 inch to 600 feet, and is meant for distribution to those owning or interested in land across the Eastern Branch.

Work during the latter part of the fiscal year has been upon the condemnation of city streets authorized by special acts of Congress, and also reports and maps upon bills introduced during the past session of Congress. The table appended hereto will give a concise idea of what has been done in regard to these special acts.

In conclusion, it may be well to note that the coming fiscal year will, in a measure, wind up the special duties assigned to this office and relating to the permanent system of highway plans. There now remains some half a dozen streets to be added under special bills which will require plats and other data connected with condemnation proceedings. After these are finished it will be very easy for the surveyor's office to handle all matters coming up in the future under the special head of street extensions.

There have been in this office a number of studies of grades made in connection with our consideration of proper location of streets and which will be of material aid to a computing engineer and his assistants in fixing grades over various parts of the city. There are also about 150 maps drawn on a scale of 1 inch to 100 feet which have been compiled from data in the surveyor's office and from special surveys made by the department. These will likewise be of great benefit to the division of the commission. It has been noted from time to time that these maps should be

# 134 OPERATIONS OF THE ENGINEER DEPARTMENT, D. C.

## Special extensions authorized and proposed.

Highway.	Act or bill.	Estimate for land.	Estimate for improvement.	Total estimate.	Condemnation.
Rhode Island avenue .	Act No. 43, approved Feb. 10, 1899.	\$75,000	-----	\$75,000	\$96,617
Nineteenth street .....	Act No. 73, approved Feb. 25, 1899.	65,000	-----	65,000	64,000
S, Twenty-second, and Decatur.	Act No. 195, approved Mar. 3, 1899.	36,514 <sup>(1)</sup>	-----	36,514	35,000
Twentieth street .....	Act No. 225, approved Mar. 3, 1899.	10,000	-----	10,000	7,000
Eleventh street.....	Act No. 195, approved Mar. 3, 1899.	260,000	\$50,000	310,000	280,120
				496,514	488,737
Sixteenth street.....	do	704,386	150,000	854,386	Now before court.
New Hampshire avenue.	do	77,342	10,000	87,342	
Pennsylvania avenue.	Act No. 225, approved Mar. 3, 1899.	3,000	-----	3,000	
Staughton street .....	do	8,000	-----	8,000	
Sherman avenue .....	do	125,500	-----	125,500	
Eckington place.....	do	4,897	-----	4,897	
Fifth street .....	do	7,500	-----	7,500	
Howard avenue .....	do	4,850	-----	4,850	Bills introduced in first session. Fifty-sixth Congress not yet passed.
				1,096,475	
Kalorama avenue .....	Senate 120, H. R. 104	25,500	-----	25,500	
Wyoming avenue .....	Senate 118, H. R. 1045	43,500	-----	43,500	
Columbia road .....	Senate 119, H. R. 1044	24,768	-----	24,768	
Le Droit avenue and S street.	Senate 109, H. R. 978	83,350	-----	83,350	
Fifteenth street .....	Senate 1944, H. R. 7075	45,600	25,000	70,600	
Seventeenth street .....	Senate 1764, H. R. 5041	166,000	-----	166,000	
Bacon street .....	Senate 2002, H. R. 5492	20,000	-----	20,000	
Fifth street, Takoma ..	Senate 1916, H. R. 5787	11,550	-----	11,550	
Wellington place .....	Senate 6773, H. R.	20,000	-----	20,000	
Vermont avenue .....	Senate 2265, H. R. 5501	111,000	50,000	161,000	
M street NE .....	Senate 2714, H. R. 7501	6,000	-----	6,000	
Lyles place .....	Senate, H. R. 8017	2,700	1,500	4,200	
Warder avenue, etc....	Senate 2964, H. R. 8688	74,570	-----	74,570	
Eighth street or Railroad avenue	Senate, H. R. 8688	37,000	-----	37,000	
				748,038	

<sup>1</sup> No estimate for Decatur.

Respectfully submitted.

WM. P. RICHARDS,  
Assistant Engineer, District of Columbia.

Capt. LANSING H. BEACH,  
Corps of Engineers, U. S. A.,  
Engineer Commissioner District of Columbia.

## REPORT OF THE SUPERINTENDENT OF PROPERTY.

WASHINGTON, D. C., August 8, 1900.

CAPTAIN: I have the honor to forward herewith statement showing materials and supplies purchased on account of the appropriations for the fiscal year ending June 30, 1900; also list of employees, and salaries paid to each.

Deliveries under the contracts for furnishing curbing, sewer pipe, vitrified paving blocks, and natural cements are still in course of execution. The reports as to these items are therefore incomplete.

Very respectfully,

R. D. SIMMS,  
Superintendent of Property.

Capt. LANSING H. BEACH,  
Corps of Engineers, U. S. A.,  
Engineer Commissioner District of Columbia.

*Miscellaneous purchases made from 1900 appropriations.*

Awning, purchased and repaired .....	\$97.80	Plumbers' supplies .....	\$6,771.69
Books, made to order .....	761.55	Periodicals and publications .....	84.00
Blank forms, printing and binding .....	2,194.88	Photographic apparatus and material .....	59.75
Boots, rubber .....	136.10	Pitch .....	8,911.28
Bicycle repairs .....	182.44	Flows, and repairs to .....	607.40
Bridge material, iron and steel structural .....	118.09	Paints, glass, and oils .....	3,578.59
Badges, and repairs to .....	20.00	Surveyors' instruments, and repairs to .....	937.23
Blue prints .....	814.55	Stationery .....	1,528.91
Broken stone, flagging, etc. ....	841.61	Saddlery .....	1,156.34
Castings, special (including water department) .....	2,114.13	Rent, District of Columbia property yards .....	300.00
Cement, asphalt .....	196.40	Rent, warehouses .....	405.00
Cement, plumbers' and slaters' .....	44.15	Repairs:	
Drugs and chemical apparatus .....	635.92	D. C. building .....	\$216.08
Dry goods .....	26.51	D. C. nursery .....	7.00
Drafting instruments and materials .....	276.99	D. C. cement house .....	34.50
Electrical supplies .....	673.72		257.58
Forge .....	4,932.40	Steam roller, repairs .....	306.25
Fertilizer .....	65.70	Stone crusher, repairs .....	209.80
Furniture, and repairs to .....	1,227.14	Seeds .....	91.25
Fuel .....	5,978.04	Tinware .....	1,944.20
Groceries .....	36.63	Typewriters, and repairs to .....	478.75
Hardware .....	4,660.44	Tools, and repairs to .....	2,778.31
Hose and couplings .....	1,280.39	Tickets, street-car .....	211.00
Hoists and derricks .....	234.40	Valves and casings (water department) .....	6,162.50
Horses .....	625.00	Wheel scraper .....	275.72
Ice .....	51.11	Water barrels, and repairs to .....	57.50
Lead, Omaha pig .....	8,124.02	Wagons, carts, and buggies, and repairs .....	4,018.27
Lumber .....	10,133.74	Pay roll District of Columbia blacksmith shop .....	1,518.35
Mortar, lime, and hair .....	186.25		
Maps, and repairs to .....	168.00	Total .....	83,794.23
Oils, illuminating and engine .....	460.51		

*Material purchased and issued from property yards.*

Material.	Quantities.	Values.
Terra-cotta sewer pipe, branches, bends, and reducers:		
24-inch sewer pipe .....	feet.. 4,178	\$2,714.65
21-inch sewer pipe .....	do. 8,285	4,816.70
18-inch sewer pipe .....	do. 10,602	3,589.71
15-inch sewer pipe .....	do. 6,941	1,706.43
12-inch sewer pipe .....	do. 30,847	5,122.98
10-inch sewer pipe .....	do. 9,060	1,365.42
8-inch sewer pipe .....	do. 1,518	141.52
6-inch sewer pipe .....	do. 6,834	512.79
8-inch to 6-inch reducers .....	number.. 25	9.50
Vitrified sewer invert blocks .....	do. 3,239	1,101.09
Vitrified sewer invert bricks .....	do. 590,610	10,483.33
Vitrified taper section sewer bricks .....	do. 9,940	233.59
Repressed vitrified paving blocks .....	do. 1,452,197	29,043.94
Repressed vitrified paving half-blocks .....	do. 41,597	415.97
Hand-made bricks .....	do. 600	9.70
Asphalt paving blocks .....	do. 506,395	29,166.84
Red sewer bricks .....	do. 851,775	8,113.24
Arch bricks .....	do. 1,800	15.30
Sidewalk paving bricks .....	do. 96,400	868.17
Red building bricks .....	do. 156,599	1,434.94
Fire bricks .....	do. 5,050	143.50
Siphons .....	do. 12	324.00
Portland cement .....	barrels.. 23,263	54,416.25
Natural cement .....	do. 30,083	21,484.17
Paving and concrete sand .....	cubic yards.. 8,755	4,377.24
Screened sand .....	do. 408	230.09
Screened pebbles .....	do. 6,100	4,574.53
Castings .....		3,001.38
Water boxes .....	number.. 755	409.00
Curbing .....	linear feet.. 46,682	29,305.98
Broken stone .....	cubic yards.. 22,915	18,595.02
Freight .....		11,093.84
Hauling .....		6,620.15
Pay roll (office work, inspection, and handling material) .....		12,434.80
Total .....		267,885.66

## 136 OPERATIONS OF THE ENGINEER DEPARTMENT, D. C.

List of employees other than those on per annum roll, and amounts paid to each.

Name.	Rate.	Clean- ing and repair- ing sewers and basins.	Replac- ing ob- struct- ed sew- ers.	Main and pipe sewers.	Subur- ban sewers.	Auto- matic flush- ing tanks.	Tiber Creek and New Jersey avenue high- level inter- cepting sewer.	North- erly portion of Tiber Creek and New Jersey avenue high- level inter- cepting sewer.	Bound- ary sewer.	East side sewer be- tween 23d and A. N. E. and 12th SE.
L. T. Boisseau .....	{ \$5.00 6.00 }									
R. D. Simms .....	5.00	\$37.72	\$35.02	\$59.28	\$79.68	\$1.50	\$56.26	\$68.00	\$38.59	\$18.05
C. T. Shoemaker .....	4.00	30.18	27.99	67.42	63.76	1.20	44.99	54.41	30.86	14.45
H. M. Spencer .....	4.00	30.18	27.99	67.42	63.76	1.20	44.99	54.41	30.86	14.45
J. A. McDannel .....	4.00	30.18	27.99	67.42	63.76	1.20	44.99	54.41	30.86	14.45
W. H. Edgar .....	3.50	26.41	24.52	59.00	55.78	1.05	39.41	47.56	26.99	12.64
H. B. vander Las .....	2.50	18.40	17.01	8.76	6.70		28.15	33.96	3.84	
Edward Morris .....	2.50	13.63	12.24	32.50	32.50	.75	44.40	50.21	19.26	9.00
Wm. Donaldson .....	4.00	30.18	27.99	67.42	63.76	1.20	96.99	54.41	30.86	70.45
H. M. Dickinson .....	3.25	24.54	22.73	54.78	51.81	.98	78.83	44.17	25.06	11.73
W. J. W. Grey .....	3.00	22.64	20.98	50.57	47.83	.91	53.28	60.26	23.13	10.83
W. H. Voss .....	3.00	22.64	20.98	50.57	47.83	.91	53.28	60.26	23.13	52.83
G. T. Hammer .....	2.00	15.11	13.98	7.70	5.90		22.52	27.17	3.07	
J. Walter Mitchell .....	2.00									
E. M. Cropley .....	2.00				14.00					5.00
Laborers .....	{ 1.50 1.75 }	8.19	30.58	27.16	22.93	1.10	16.81	18.02	23.49	16.09
Totals .....		310.00	310.00	620.00	620.00	12.00	624.90	627.25	310.00	250.00

Name.	Rate.	Inter- cepting sewer from Twelfth SE. to pumping station, foot New Jersey avenue.	Repairs streets, avenues, and alleys.	Side- walks and curbs.	Construc- tion of county roads.	Bridges.	Schools.	In- crease fire de- part- ment.	Improve- ments and repairs.
L. T. Boisseau .....	{ \$5.00 6.00 }		\$84.00						
R. D. Simms .....	5.00	\$30.90	65.00		\$130.00	\$125.00			\$195.00
C. T. Shoemaker .....	4.00	24.74	108.00		104.00	108.00			156.00
H. M. Spencer .....	4.00	24.74	108.00		104.00	108.00			156.00
J. A. McDannel .....	4.00	24.74	108.00		104.00	108.00			156.00
W. H. Edgar .....	3.50	21.64	94.50	\$45.50	45.50	94.50			136.50
H. B. vander Las .....	2.50	5.63	32.50						32.50
Edward Morris .....	2.50	15.48	100.00		97.50		\$35.00		32.50
Wm. Donaldson .....	4.00	24.74	108.00	52.00	104.00	52.00			104.00
H. M. Dickinson .....	3.25	20.12	133.25		130.00	42.25	45.50		81.25
W. J. W. Grey .....	3.00	18.57	160.50		78.00	59.00	42.00		78.00
W. H. Voss .....	3.00	18.57	162.00		39.00	78.00			78.00
G. T. Hammer .....	2.00	4.55	32.00	14.00		14.00		\$16.00	26.00
J. Walter Mitchell .....	2.00							12.00	6.00
E. M. Cropley .....	2.00				26.00				
Laborers .....	{ 1.50 1.75 }	15.53	104.29	4.50	12.00	33.25		1.00	43.37
Total .....		250.00	1,400.04	116.00	974.00	812.00	122.50	29.00	1,281.12

# OPERATIONS OF THE ENGINEER DEPARTMENT, D. C. 137

employees other than those on per annum roll, and amounts paid to each—Cont'd.

Name.	Rate.	Assessment and permit work.		Pumping expenses and pipe distribution.	North wing of almshouse.	Male workhouse.	Girls' reform school.	Repairs to county roads.	Total.
		Streets.	Sewers.						
Bureau.....	{ \$5.00 }	\$65.00	\$143.00						\$292.00
Bureau.....	{ 5.00 }								
Bureau.....	{ 5.00 }	190.00		\$65.00				\$70.00	1,275.00
Demaker.....	4.00	204.00	104.00	52.00				56.00	1,252.00
Dancer.....	4.00	204.00	104.00	52.00				56.00	1,252.00
Dannel.....	4.00	204.00	104.00	52.00				56.00	1,252.00
Dgar.....	3.50	133.00	45.50	45.50				49.00	1,004.50
nder Las.....	2.50	65.00						32.50	285.00
Morris.....	2.50	127.50	65.00	32.50	\$7.00	\$20.50		55.00	782.50
aldson.....	4.00	204.00	104.00					56.00	1,252.00
ickinson.....	3.25	165.75	84.50						1,017.25
Grey.....	3.00	153.00	78.00						937.50
os.....	3.00	153.00	78.00						939.00
ummer.....	2.00	62.00					\$12.00	27.00	298.00
r Mitchell.....	2.00								18.00
opley.....	2.00								45.00
s.....	{ 1.50 }	100.75	24.00	1.00		4.50		27.49	538.05
s.....	{ 1.75 }								
tal.....		2,021.00	934.00	300.00	7.00	25.00	12.00	464.99	12,434.80

## SUMMARY.

l purchased but not stored in property yards.....	\$63,794.23
l purchased and issued from property yards.....	267,885.66
s (office work, inspection, and handling material).....	12,434.80
, blacksmith shop.....	1,518.85
and total.....	365,633.04

## REPORT OF THE PERMIT CLERK.

WASHINGTON, July 30, 1900.

RAIN: Permits issued during the fiscal year ended June 30, 1900, were:

connections.....	1,175
repairs.....	916
specials.....	395
	2,486
connections.....	1,374
repairs.....	1,054
specials.....	815
	3,243
id electric light connections.....	1,064
id electric light repairs.....	216
id electric light specials.....	4
	1,284
s mains.....	85
d and repair electric-light conduits.....	104
and replace telegraph and telephone poles.....	176
railings to inclose parkings.....	349
atic bicycle pumps, erect.....	55
et railroad conduits with sewers.....	148
it, extend and replace telephone.....	3
its, lower under railroad tracks.....	9
its, connect with sewer.....	26
s, connect underground, to rails of track.....	7
s, repair and replace telegraph.....	8
pipe, lay under sidewalk.....	4
rations, make in the public space.....	5
rs, erect in alleys.....	4

# 138 OPERATIONS OF THE ENGINEER DEPARTMENT, D. C.

Gas mains, repair, Pintsch .....	2
Hitching posts, erect .....	8
Pipe, replace suction .....	1
Walls, cement .....	13
Alleys, close temporarily .....	1
Alleys, grade and excavate in .....	3
Alleys, locate well digger in .....	3
Alleys, replace cobble with granite-block paving .....	1
Alleys, place ashes in .....	1
Area, build steps to .....	1
Area, pave and repair pavement in .....	10
Awning frames, wire, for electric lights .....	7
Bridges, haul loads of 5 tons or more over .....	6
Bridges, repair floor of .....	1
Bridges, place trolley wires over draw .....	1
Bridges, place trough for trolley wire on .....	1
Bicycle runway, build in parking to basement .....	1
Cables, suspend aerial, and feeder .....	15
Car, move over street .....	1
Cellar door, remove temporarily .....	1
Copings, erect and repair .....	60
Cellar door, remove and fill space .....	1
Curb, reset .....	1
Conduit, lay under sidewalk at new truck house .....	2
Conduit, repair and change line of .....	2
Conduit, extend .....	1
Driveways, construct and repair .....	24
Excavations, make to ascertain character for foundation .....	1
Engines, move steam traction over streets and roads .....	15
Engines, operate in alleys .....	2
Electric decorations, hang over sidewalks .....	2
Fences, erect without fee .....	24
Fences, repair, renew, or replace .....	517
Fences, erect wire screen on .....	1
Fire hydrants, use .....	4
Flagging, place in tree space .....	1
Furnace, use portable on streets to weld track joints .....	1
Frame, erect for displaying election returns .....	1
Gutter, place pipe in .....	2
Gutter, lay cobble .....	2
Gutter, make across sidewalk .....	1
Gutter, clean .....	1
Gas stopcock boxes, regulate to grade .....	4
Gravel, place in public space for use of District of Columbia .....	2
Hand rail, erect on terrace steps .....	1
Hitching rope, sidewalks .....	57
Hitching post, replace .....	1
Hedges, plant back of sidewalk .....	2
Lamps, hang electric .....	39
Lanterns, swing from tree .....	1
Lights, place in box sign .....	2
Manhole top, replace to grade .....	1
Manholes, build on railroad ducts .....	5
Material, take from streets not graded .....	19
Material, remove from streets (granite blocks and ashes) .....	3
Material, place in streets (broken bricks) .....	3
Manure pit, repair hinges to door of .....	1
Overhead wires, connect to cable .....	1
Overhead wires, make house connections with .....	67
Overhead wires, string .....	89
Overhead wires, replace iron with copper .....	27
Overhead wires, increase size of .....	4
Overhead wires, transfer and change location of .....	16
Overhead wires, renew .....	8
Overhead wires, replace by underground (railroad) .....	2
Overhead wires, make necessary repairs .....	127
Parking leads, lay .....	360
Parking leads, relay and repair .....	180

space, deposit material on .....	4
place timber guard on .....	2
pave over .....	45
store paving blocks on .....	3
pavement, reduce .....	1
pavement, remove .....	4
pavement, repair .....	8
pavement, replace brick with cement .....	6
grade .....	79
set guy for trolley .....	1
set and replace trolley .....	3
set railroad trolley .....	7
t, repair in alley .....	5
replace in parking with cement .....	3
replace with arch in sidewalk .....	1
set for street lighting .....	1
s, grade and repair .....	21
s, remove sample of paving .....	2
s, place ashes in .....	1
s, sprinkle .....	3
s, lay and repair .....	107
space, grade .....	1
s, occupy for business purposes .....	100
parkings, erect, replace, and repair .....	154
disposal plant, maintain Waring system .....	1
lose during progress of work .....	6
connect foundation of with sewer .....	1
s, drill in sidewalk .....	1
s, remove from sidewalk .....	1
es, paint .....	2
re, pave .....	8
ant magnolia in parking .....	1
move .....	18
m .....	2
nitewash .....	50
se, move through street .....	1
ment over .....	1
uild and repair retaining, on parking .....	19
bles, lay .....	55
Sunday .....	1
place chairs on .....	1
change to bridge over Chesapeake and Ohio Canal at Potomac street .....	1

RAILROAD COMPANIES.

and Potomac River:	
duct underground system .....	1
cars in the street .....	2
ivate to ascertain depth to sewer .....	1
l manhole and duct Fifth and D streets NW .....	1
portable furnace on street for cast welding rails .....	1
duct (8-way), New York avenue and Eleventh street NW .....	1
ron poles on Eleventh street SE .....	1
l manhole and 4-way duct, Four-and-a-half street and Maryland enue SW .....	1
ect tracks, Water and Seventh streets SW., with P. E. P., conduit ...	1
oil on streets to thaw switches and slots .....	1
g Feeder cables (2,500,000 centimeters) on Anacostia Bridge .....	1
ge track centers .....	1
wires over Anacostia Bridge draw .....	1
nd underground system (Fourth street, etc.) .....	1
n connecting curves, Brightwood, north of Florida avenue .....	1
n connecting curves, Eleventh and F and Eleventh and G streets N .....	2
n connecting curves, Fourth street and New York avenue .....	1
ect shelter station, Eleventh street SE., with overhead wires .....	1
l manhole and duct, Fourth street and New York avenue .....	1
e pins between tracks to haul in cables, Fifth street and New York enue .....	1

<b>Capital railway:</b>	
Extend double trolley, Navy-Yard Bridge to plow pit.....	1
Set and reset iron and wooden poles.....	1
Replace wooden poles in Nichols avenue.....	1
Erect poles and span wires over turnout, Nichols avenue.....	1
<b>Capital Traction Company:</b>	
Pave with asphalt south half of roadway of L street, square 907.....	1
Regulate surface of unpaved alley, square 635.....	1
<b>City and Suburban:</b>	
Construct track in North Capitol street and Michigan avenue.....	1
Drive pins between tracks to haul in cables.....	1
Park cars in T street NE.....	1
Replace iron with wooden poles in Fourth street NE.....	1
Burn oil on streets to thaw switches and slots.....	1
Put in connecting curves, Fifth and G streets NW.....	1
Build manhole and lower duct, New Jersey avenue and C street.....	1
Move and relocate pole at terminus on Bunker Hill road.....	1
<b>Columbia:</b>	
Erect guy poles, intersection Fifteenth street, H street, and Bennings road.....	1
Construct duct line in Bennings road.....	1
<b>Georgetown and Tenallytown:</b>	
Reset poles in Thirty-second street.....	1
Reconstruct road.....	1
Use steam roller in reconstruction.....	1
<b>Metropolitan:</b>	
Construct cross overs in Ninth street NW north and south of Pennsylvania avenue.....	1
Build manhole and duct, Fifth and D streets NW.....	1
Install underground system in Florida avenue to car barn.....	1
Construct additional conduit track and change track, Brightwood avenue north of Florida avenue.....	1
Extend conduit, Brightwood avenue north of Florida avenue.....	2
Build manhole and duct to Anacostia and Potomac River Railroad, Four-and-a-half street and Maryland avenue.....	1
Burn oil on streets to thaw switches and slots.....	1
Construct connecting curves, Thirty-second and P streets, Thirty-second and O streets, Thirty-second street and Dumbarton avenue, and lay double track, Thirty-second street between Dumbarton avenue and P street NW.....	4
Construct connecting curves, Thirty-sixth street and Prospect avenue.....	1
Construct connecting curves, Sixth and B streets NW.....	1
Construct connecting curves, Thirteenth and East Capitol streets.....	1
Construct connecting curves, New Jersey avenue and C street NW.....	1
Construct connecting curves, Louisiana avenue at Fifth street.....	1
Construct connecting curves, Ninth and G streets NW.....	1
Construct connecting curves, Fourteenth and G streets NW.....	1
Construct connecting curves, New York avenue and Ninth street.....	1
Lay water main in P street SW., power house to Potomac River.....	1
Build manhole in Ninth street above K street NW.....	1
<b>Baltimore and Ohio:</b>	
Repair floor, bridge over tracks, Queens Chapel road.....	1
Extend side tracks into square 678.....	1
Double-track Y connecting Metropolitan and Washington branches.....	1
Lay additional tracks into square 678.....	1
Pave roadway in parking front of depot with vitrified bricks.....	1
Erect electric lights, New Jersey avenue between C and D streets.....	1
Lay fender in sidewalk space at freight house, D street.....	1
Erect electric lights on driveway in parking front depot.....	1
Put track under main siding in Delaware avenue between F and G streets.....	1
Change switch into square 712.....	1
Reconstruct and extend bridge over tracks at Second street NE.....	1
Open streets for purpose of putting interlocking device in operation at the Y.....	1
<b>Baltimore and Potomac:</b>	
Change location of switch, Twelfth street and Maryland avenue SW.....	1
Suspend cable and renew telegraph wires along right of way.....	1
Pave parking with granite blocks, D between Thirteenth and Thirteen-and-a-half streets SW.....	1

Baltimore and Potomac—Continued.

Change location of tracks crossing Thirteenth and Thirteen-and-a-half streets SW.....	1
Renew rails through New Jersey avenue SE. of all tracks.....	1
Make switch connection with signal pole on Maryland avenue between Sixth and Seventh streets SW.....	1
Make excavations in Thirteenth and in Thirteen-and-a-half streets SW. to repair bumping blocks.....	1
Philadelphia, Wilmington and Baltimore:	
Erect telegraph pole, Eleventh and L streets SE.....	1

UNITED STATES GOVERNMENT.

Government Printing Office (officer in charge of construction):	
Store paving blocks in parking.....	1
Excavate in alley and connect boiler house with sewer.....	1
Connect subsoil drains with manhole in G street.....	1
Connect with sewer in G street.....	1
Post-Office Department:	
String overhead wires from Fourteenth and B streets NW, to post-office building.....	1
Smithsonian Institution:	
Transport tender of "John Bull" engine through streets.....	1
Superintendent State, War, and Navy Department building:	
String telephone wire.....	1
United States Department of Agriculture:	
Gather beans from "coffee" trees.....	1
United States Census Office:	
Erect fence to inclose parking.....	1
Back wagon across sidewalk, First between B and C streets NW.....	1
United States National Museum:	
Enlarge water-service pipe in sidewalk at annex.....	1
Grand total.....	10,589

There has been a decrease in number of permits as compared with the fiscal year ended June 30, 1899, and also in the amount received for permit fees paid the collector of taxes, District of Columbia, as shown by his report.

Permits issued during the fiscal year 1898-99.....	11,330
Permits issued during the fiscal year 1899-1900.....	10,589

The following table shows the number of permits issued during the last five years and the amount of money paid for permit fees to the collector of taxes, District of Columbia, during that time:

Fiscal year.	Permits issued.	Fees paid.
1895-96.....	11,453	\$7,236
1896-97.....	10,153	7,355
1897-98.....	10,465	7,845
1898-99.....	11,330	7,692
1899-1900.....	10,589	6,797

Eight hundred and fifty-seven communications have been referred to this office, briefs made on cards, the necessary permits written, the action noted, and the papers returned to the record office of the engineer department, or through that office to the division having charge of the inspection of the work for which the permits were issued.

One hundred and twenty-one names were recorded for positions as laborers on the District work during the year.

The only change in the work of the office during the year has been the making of daily instead of weekly reports to the computing engineer of the locations of cuts in the various improved pavements of the streets, roads, and alleys.

Very respectfully,

H. M. WOODWARD,  
Permit Clerk, District of Columbia.

Capt. LANSING H. BEACH,  
Corps of Engineers, U. S. A.,  
Engineer Commissioner District of Columbia.

## 142 OPERATIONS OF THE ENGINEER DEPARTMENT, D. C.

## REPORT OF THE CHIEF CLERK.

WASHINGTON, August 1, 1900.

CAPTAIN: I have the honor to submit the following report for the fiscal year ended June 30, 1900:

Communications received, briefed, and recorded .....	11,872
Indorsements, references, and reports thereon.....	59,360
Letters and orders prepared.....	4,896
Copies of contracts drawn.....	440
Vouchers and bills prepared, recorded, and forwarded.....	5,732

Schedules of bids received during the fiscal year for work and materials under engineer office, and statement of contracts for street improvements, sewers, construction materials, and miscellaneous work are herewith.

Very respectfully,

A. Y. LAKENAN,  
Chief Clerk, Engineer Department.

Capt. LANSING H. BEACH,  
Corps of Engineers, U. S. A.,  
Engineer Commissioner District of Columbia.

*Schedule of proposals for grading certain streets and avenues, opened July 8, 1899.*

Bidders.	Michigan avenue.	Albermarle street.	Kennesaw avenue and Park road.	Twenty-second and Twenty-fourth streets, Langdon.
Geo. B. Mullen .....	26	23	32	36
E. G. Gummel .....	28	28	29	39
M. F. Talty .....	23	27	31	38
Andrew Gleeson .....	30	28	40	35
Lyons Bros. ....	26	27	31	40
James Frawley .....	.....	24½	29½	25½

*Schedule of proposals for grading Twenty-second and Twenty-fourth streets, Langdon, opened August 5, 1899.*

Bidder.	Price per cubic yard.	Cost.
Matthew Myers .....	\$0.32	\$3,840.00
Andrew Gleeson .....	.33	3,960.00
Martin McNamara & Co .....	.37	4,440.00
E. G. Gummell .....	.39	4,680.00

*Schedule of proposals for grading roadway from Brightwood avenue across Rock Creek Park, opened September 2, 1899.*

Bidder.	East of Rock Creek.	West of Rock Creek.	Total roadway.
M. McNamara .....	\$0.23	\$0.24	\$0.23
Andrew Gleeson .....	.23	.29	.23½
M. F. Talty .....	.25	.30	.26
G. B. Mullin .....	.24	.28	.26

*Schedule of proposals for grading Thirty-seventh street, opened October 21, 1899.*

Bidder.	Price per cubic yard.	Total.
M. F. McNamara & Co.....	\$0.24½	\$1,225.00
Andrew Gleeson .....	.27	1,350.00
M. F. Talty .....	.29	1,450.00
E. G. Gummell .....	.35	1,750.00
James Frawley.....	.41	2,060.00

# OPERATIONS OF THE ENGINEER DEPARTMENT, D. C. 143

*Schedule of bids for grading Pennsylvania and Branch avenues SE., opened May 26, 1900.*

Bidder.	Price per cubic yard.
P. D. Vinson .....	\$0.16
Coyle & Duffy .....	.22
Matthew Myers .....	.24½
Andrew Gleeson .....	.15
Lyons Bros .....	.23½

*Schedule of bids for grading Kansas avenue, opened June 9, 1900.*

Bidder.	Grading per cubic yard.
G. B. Mullin .....	\$0.17½
Andrew Gleeson .....	.17
Matthew Myers .....	.19
Lyons Bros .....	.32
P. D. Vinson .....	.16½

*Schedule of proposals for improving I street between South Capitol street and New Jersey avenue, opened May 12, 1900.*

Bidder.	Paving trap-rock road-way, per square yard (estimated 4,400 yards).	Setting granite curb, per linear foot (estimated 2,400 linear feet).	Total cost.
Lyons Bros .....	\$0.65	\$0.17	\$3,268.00
Andrew Gleeson .....	.55	.12	2,708.00
E. G. Gummell .....	.70	.18	3,512.00

*Schedule of proposals for improving Adams Mill road, from Columbia road to Zoological Park, opened June 11, 1900.*

Bidder.	Grading.	Laying cobble gutters.	Loading, hauling, spreading, and rolling macadam.	Total.
Andrew Gleeson .....	\$0.23	\$0.45	\$0.75	\$2,065.00
Lyons Bros .....	.30	.30	1.16	2,638.00
G. B. Mullin .....	.22½	.34	1.24	2,417.50

*Schedule of proposals for improving Connecticut avenue west of Rock Creek, opened June 16, 1900.*

Bidder.	Grading.	Remove and replace macadam.	Remove and replace gutters.	Total.
Andrew Gleeson .....	\$0.95	\$0.73	\$0.30	\$2,775.00
G. B. Mullin .....	.92	.70	.30	2,665.00

*Schedule of proposals for paving streets and avenues with sheet asphalt, opened June 23, 1900.*

Bidder.	Asphalt roadway, per square yard.	Vitrified block gutters, per square yard.	Total.
Barber Asphalt Paving Co .....	\$1.79½	\$1.40	\$59,730.00
Cranford Paving Co .....	1.80	1.40	59,840.00
Southern Asphalt Paving Co .....	2.00	1.60	66,720.00
Metropolitan Asphalt Paving Co .....	2.10	1.70	70,140.00

## 144 OPERATIONS OF THE ENGINEER DEPARTMENT, D. C.

*Schedule of proposals for making repairs to asphalt pavements, opened June 9, 1900.*

Item.	Per—	One-year contract.			
		Cranford Paving Co.		Barber Asphalt Paving Co.	
		Price.	Total.	Price.	Total.
Standard asphalt pavement on 6-inch base.	Square yard .....	\$1.77	\$28,320.00	\$1.79	\$28,640.00
Standard asphalt surface (2½ inches).....	do .....	.92	16,560.00	.96	17,280.00
Standard asphalt surface (2 inches).....	do .....	.82	4,100.00	.86	4,300.00
Standard asphalt surface, measured in cart.	Cubic foot .....	.61	30,500.00	.63	31,500.00
Asphalt binder, measured in cart .....	do .....	.82	30,400.00	.83	31,350.00
Standard asphalt surface, by burner .....	do .....	1.00	16,000.00	1.05	16,800.00
Total .....			125,880.00		129,870.00

Item.	Per—	Three-year contract.			
		Cranford Paving Co.		Barber Asphalt Paving Co.	
		Price.	Total.	Price.	Total.
Standard asphalt pavement on 6-inch base.	Square yard .....	\$1.77	\$28,320.00	\$1.78	\$28,480.00
Standard asphalt surface (2½ inches).....	do .....	.91	16,380.00	.94	16,920.00
Standard asphalt surface (2 inches).....	do .....	.81	4,050.00	.85	4,250.00
Standard asphalt surface, measured in cart.	Cubic foot .....	.60	30,000.00	.63	31,500.00
Asphalt binder, measured in cart .....	do .....	.81	29,450.00	.83	31,350.00
Standard asphalt surface, by burner .....	do .....	1.00	16,000.00	1.05	16,800.00
Total .....			124,200.00		129,300.00

Item.	Per—	Five-year contract.			
		Cranford Paving Co.		Barber Asphalt Paving Co.	
		Price.	Total.	Price.	Total.
Standard asphalt pavement on 6-inch base.	Square yard .....	\$1.74	\$27,840.00	\$1.77	\$28,320.00
Standard asphalt surface (2½ inches).....	do .....	.89	16,020.00	.93	16,740.00
Standard asphalt surface (2 inches).....	do .....	.79	3,950.00	.84	4,260.00
Standard asphalt surface, measured in cart.	Cubic foot .....	.69	29,500.00	.61	30,500.00
Asphalt binder, measured in cart .....	do .....	.80	28,500.00	.82	30,400.00
Standard asphalt surface, by burner .....	do .....	1.00	16,000.00	1.00	16,000.00
Total .....			121,810.00		126,160.00

*Schedule of proposals for laying cement sidewalks in the District of Columbia, opened September 23, 1899.*

Bidder.	Class A.	Class B.	Total.
Fred Drew .....	\$1.13	\$1.23	\$28,300.00
Andrew Gleeson .....	1.19	1.24	72,180.00
F. M. Kemp & Son .....	1.04	1.08	63,337.00
Cranford Paving Co .....	.96	1.02	58,600.00

OPERATIONS OF THE ENGINEER DEPARTMENT, D. C. 145

*Schedule of proposals for construction of sewers, opened July 29, 1899.*

SEWER A.

Bidder.	Earth excavation above sewer subgrade.	Embankment.	Brick masonry laid in natural-cement mortar.	Vitrified-brick masonry laid in Portland-cement.	Concrete masonry.	Total cost.
John Jacoby .....	\$0.70	\$0.20	\$9.50	\$16.00	\$5.00	\$65,485.00
T. Wallace Reilly .....	1.00	.10	9.00	15.00	4.75	77,820.00
John M. Murphy .....	.95	.25	9.50	17.50	6.09	78,835.00
B. J. Coyle .....	1.20	.01	10.20	21.00	6.95	94,496.00

SEWER B.

Bidder.	Excavating above sewer subgrade.	Brick masonry laid in natural-cement mortar.	Vitrified masonry laid in Portland-cement mortar.	Concrete masonry.	Total cost.
John Jacoby .....	\$0.50	\$9.00	\$16.00	\$5.00	\$104,130.00
T. Wallace Reilly .....	1.00	9.00	15.00	4.75	145,350.00
B. J. Coyle .....	.82	9.95	20.50	6.70	142,372.50
T. B. Jones & Co .....	.85	9.50	16.60	4.95	136,423.00

SEWER C.

Bidder.	Excavation above sewer subgrade.	Embankment.	Brick masonry laid in natural-cement mortar.	Red brick masonry laid in Portland-cement mortar.	Vitrified-brick masonry laid in Portland-cement mortar.	Concrete masonry.	Total cost.
John Jacoby .....	\$0.80	\$0.20	\$8.50	\$12.50	\$16.00	\$4.20	\$217,660.00
T. Wallace Reilly .....	.40	.05	8.25	9.25	13.50	4.25	208,675.00
John M. Murphy .....	.86	.01	8.00	9.90	14.50	4.50	206,712.00
B. J. Coyle .....	.88	.20	9.30	10.70	18.00	5.40	244,936.00
T. B. Jones & Co .....	.83	.15	8.35	12.10	16.15	4.45	218,167.00
Cranford Paving Co .....	.30	.25	9.00	10.75	16.25	5.50	235,960.00
Lyons Brothers .....	.50	.35	9.00	10.50	18.00	5.50	252,270.00
Andrew Gleeson .....	.60	.25	9.50	10.50	17.00	5.25	258,485.00
John Miller .....	.30	.20	8.00	9.92	13.50	4.25	204,174.60
Ferguson Contracting Co. ....	.84	.20	9.25	11.25	16.00	4.60	232,180.00

SEWER D.

Bidder.	Excavating above sewer subgrade.	Brick masonry laid in natural-cement mortar.	Vitrified-brick masonry laid in Portland-cement mortar.	Concrete masonry.	Total cost.
Lyons Brothers .....	\$1.00	\$10.50	\$18.00	\$6.00	\$6,426.00
Andrew Gleeson .....	.75	10.75	18.00	5.75	5,883.00
E. G. Gummel .....	.87	13.00	24.00	9.00	7,445.50
Martin McNamara & Co .....	.85	11.38	18.20	5.82	6,268.80

146 OPERATIONS OF THE ENGINEER DEPARTMENT, D. C.

*Schedule of proposals for construction of sewers, opened July 29, 1899—Continued.*

SEWER E.

Bidder.	Excavation above sewer subgrade.	Brick masonry laid in natural-cement mortar.	Vitrified-brick masonry laid in Portland-cement mortar.	Concrete masonry.	Invert blocks.	Total cost.
Lyons Brothers .....	\$0.50	\$10.00	\$18.00	\$5.50	\$0.70	\$1,708.00
Andrew Gleeson .....	.60	9.50	17.00	5.25	.69	1,752.00
E. G. Gummel .....	.85	11.00	20.00	6.00	.90	2,138.00
Martin McNamara & Co .....	.60	10.86	18.20	5.96	.60	1,877.00

SEWER F.

Bidder.	Excavation above sewer subgrade.	Brick masonry laid in natural-cement mortar.	Vitrified-brick masonry laid in Portland-cement mortar.	Concrete masonry.	Invert blocks.	24-inch pipe.	21-inch pipe.	18-inch pipe.	15-inch pipe.	12-inch pipe.	10-inch pipe.	Total cost.
Lyons Brothers .....	\$0.50	\$10.00	\$19.00	\$5.90	\$0.75	\$0.90	\$0.85	\$0.78	\$0.68	\$0.62	\$0.55	\$8,015.90
Andrew Gleeson .....	.55	9.50	18.00	5.50	.69	.80	.70	.60	.50	.40	.36	7,565.36
E. G. Gummel .....	.68	10.00	20.00	6.00	.80	.87	.81	.74	.64	.54	.47	8,254.70
Martin McNamara & Co .....	.56	10.26	18.20	5.95	.60	1.34	1.14	.96	.87	.74	.60	8,859.00

*Schedule of proposals for constructing sewers, bids opened October 21, 1899.*

SEWER A.

Bidder.	Excavation above sewer subgrade.	Brick masonry in natural cement.	Vitrified-brick masonry in Portland cement.	Concrete masonry.	Invert blocks.	Total cost.
Adam McCandlish .....	\$0.55	\$9.00	\$15.50	\$4.50	\$0.60	\$3,302.50
W. F. Brenizer .....	.56	9.55	14.95	5.00	.58	3,950.40
John Jacoby .....	.60	9.50	17.00	4.75	.68	4,147.00
Lyons Brothers .....	.60	9.85	16.90	5.00	.70	4,268.20
E. G. Gummel .....	.75	9.66	17.75	4.60	.75	4,559.80

SEWER B.

Adam McCandlish .....	\$1.50	\$9.00	\$15.00	\$4.75	\$0.60	\$4,841.50
W. F. Brenizer .....	.48	9.00	13.75	4.90	.55	4,720.75
John Jacoby .....	.50	9.75	18.00	5.00	.70	5,265.50
Lyons Brothers .....	.60	9.85	16.90	5.00	.75	5,494.00
E. G. Gummel.....	.75	10.25	20.00	5.00	.85	6,101.50

SEWER C.

Bidder.	Excavation above sewer subgrade.	Brick masonry laid in natural-cement mortar.	24-inch pipe.	21-inch pipe.	18-inch pipe.	Total cost.
Adam McCandlish .....	\$0.48	\$9.00	\$0.70	\$0.60	\$0.55	\$1,806.00
W. F. Brenizer .....	.46	10.00	.77	.69	.61	1,920.39
Lyons Brothers .....	.55	9.90	.80	.75	.68	2,212.39
E. G. Gummel .....	.47	9.00	.79	.68	.67	1,971.00

OPERATIONS OF THE ENGINEER DEPARTMENT, D. C. 147

*Schedule of proposals for constructing sewers, bids opened October 21, 1899—Continued.*

SEWER D.

Bidder.	Excavation above sewer subgrade.	Brick ma- sonry laid in natural ce- ment.	24-inch pipe.	21-inch pipe.	Total cost.
Adam McCandlish.....	\$0.55	\$9.00	\$0.60	\$0.55	\$1,829.00
W. F. Brenizer.....	.46	10.00	.77	.69	1,851.45
Lyons Brothers.....	.60	10.50	.90	.88	2,286.30
E. G. Gummel.....	.47	10.00	.88	.72	1,924.55

SEWER E.

Bidder.	Excavation above sewer subgrade.	Brick ma- sonry laid in natural- cement mor- tar.	12-inch pipe.	10-inch pipe.	Total cost.
Adam McCandlish.....	\$0.50	\$9.00	\$0.40	\$0.38	\$2,170.06
W. F. Brenizer.....	.46	10.00	.45	.42	2,197.20
Lyons Brothers.....	.60	10.50	.60	.55	2,841.70
E. G. Gummel.....	.50	10.50	.39	.35	2,138.18

*Schedule of proposals for the construction of sewers, opened June 9, 1900.*

SEWER A.

Bidder.	Excava- tion above sub- grade.	Brick ma- sonry laid in natural cement.	21-inch pipe laid.	Total cost.
P. D. Vinson.....	\$0.24½	\$8.00	\$0.60	\$649.63
M. F. Guiney.....	.34	8.60	.68	766.52
E. G. Gummel.....	.40	10.00	.60	743.20
Duffy & Coyle.....	.40	10.50	.70	824.70
Andrew Gleeson.....	.50	12.00	.75	926.50
Lyons Brothers.....	.48	11.00	.85	989.54

SEWER B.

Bidder.	Excava- tion above sub- grade.	Brick ma- sonry laid in natural cement.	21-inch pipe laid.	Total cost.
P. D. Vinson.....	\$0.29½	\$8.00	\$0.63	\$949.49
M. F. Guiney.....	.57	8.60	.71	1,387.91
E. G. Gummel.....	.60	10.00	.63	1,235.50
Duffy & Coyle.....	.45	10.50	.70	1,225.85
Andrew Gleeson.....	.59	12.00	.75	1,464.17
Lyons Brothers.....	.60	11.00	.85	1,552.80

SEWER C.

Bidder.	Excava- tion above sub- grade.	Brick ma- sonry laid in natural cement.	21-inch pipe laid.	Total cost.
P. D. Vinson.....	\$0.28½	\$8.50	\$0.67½	\$1,203.75
M. F. Guiney.....	.42	10.60	.85	1,619.20
E. G. Gummel.....	.60	11.00	.70	1,542.00
Duffy & Coyle.....	.45	12.00	.85	1,666.50
Andrew Gleeson.....	.60	12.00	.95	1,849.00
Lyons Brothers.....	.75	11.00	.95	2,154.50

## 148 OPERATIONS OF THE ENGINEER DEPARTMENT, D. C.

*Schedule of proposals for the construction of sewers, opened June 9, 1900—Continued.*

## SEWER D.

Bidder.	Excavation above subgrade.	Brick masonry laid in natural cement.	Vitrified brick masonry laid in Portland cement.	Concrete masonry, natural cement.	Concrete masonry, Portland cement.	Total cost.
M. F. Guiney .....	\$1.45	\$9.93	\$19.45	\$5.87	\$7.48	\$4,458.71
E. G. Gummell .....	2.00	24.00	44.00	14.00	24.00	9,588.00
Andrew Gleeson .....	2.75	12.50	42.00	9.00	11.00	8,197.00

## SEWER E.

Bidder.	Excavation above subgrade.	Brick masonry laid in natural cement.	Rock excavation.	10-inch pipe laid.	12-inch pipe laid.	Total cost.
P. D. Vinson .....	\$0.371	\$8.50	\$3.00	\$0.341	\$0.434	\$3,479.24
J. P. Larguey .....	.47	11.50	4.00	.43	.48	4,167.75
E. G. Gummell .....	.50	12.00	4.00	.44	.46	4,244.90
Lyons Brothers .....	.58	11.00	8.00	.54	.58	5,145.30
Andrew Gleeson .....	.59	12.00	3.75	.55	.63	5,129.10

*Schedule of bids for constructing Massachusetts avenue masonry bridge, opened June 16, 1900.*

Bidder.	Earth excavation.	Rock excavation.	Portland cement, concrete for foundations and backing for first-class masonry.	First-class masonry.	Second-class masonry.	Ring stones.	Coping.	Springing course stones.
The Brennan Construction Co.....	\$6.55	\$2.00	\$5.64	\$22.00	\$19.00	\$40.00	\$40.00	\$38.00
The Cranford Paving Co.....	.95	2.00	6.70	20.50	12.00	41.90	40.00	41.00
McIlvain, Unkefer Co. <sup>1</sup> .....				31.66	14.43	42.66	42.66	35.71

Bidder.	Portland cement, rubble masonry backing for second-class masonry.	Red brick arch masonry.	Portland cement, concrete for the abutments.	Portland cement, rubble for the abutments.	Natural hydraulic cement, concrete for the haunching.	Natural hydraulic cement, rubble for the haunching.	Total, using concrete in haunching and abutments.	Total, using rubble in haunching and abutments.
The Brennan Construction Co.....	\$6.75	\$12.70	\$5.64	\$6.60	\$4.45	\$5.25	\$100,618.64	\$107,145.56
The Cranford Paving Co.....	6.75	12.90	6.75	6.75	5.00	5.00	107,643.54	108,253.66
McIlvain, Unkefer Co. <sup>1</sup> .....								

<sup>1</sup> This estimate is for the stone delivered at the site. Total, \$22,504.

**OPERATIONS OF THE ENGINEER DEPARTMENT, D. C. 149**

*Schedule of bids for constructing arch over the mouth of Broad Branch, opened June 9, 1900.*

Bidder.	Masonry.			Total.
	Stone.	Brick arch.	Concrete.	
	<i>Cu. yds.</i>	<i>Cu. yds.</i>	<i>Cu. yds.</i>	
Lyons Bros.....	13.75	15.35	7.20	\$3,857.00
Albert Weber.....	8.50	11.00	8.00	2,845.00

*Schedule of proposals for constructing a school building on lots 12 and 13, block 22, Columbia Heights.*

Bidder.	Amount.
George W. Corbett.....	\$32,793.45
N. H. Thomas.....	28,840.00
Gleeson & Humphrey.....	31,800.00

*Schedule of proposals for constructing an additional building for the Girls' Reform School, opened August 5, 1899.*

Bidder.	Amount.
Pavarini & Greer.....	\$41,900.00
W. E. Speir.....	45,700.00
John Hughes, jr.....	43,100.00
Edw. F. Jones.....	41,840.00
N. H. Thomas.....	41,600.00
D. F. Mockbee.....	49,607.00
E. Landvoight and W. A. Kimmel.....	48,797.00

*Schedule of proposals for constructing an addition to almshouse, opened August 5, 1899.*

Bidder.	Amount.	If cement mortar is used add—	Remarks.
E. Landvoight and W. A. Kimmel.....	\$16,989.00	\$500.00	2 bids submitted. Specifications did not accompany bid.
John Hughes, jr.....	16,680.00	330.00	
D. F. Mockbee.....	17,090.00	500.00	
Pavarini & Greer.....	15,900.00	400.00	
Gleeson & Humphrey.....	18,300.00	200.00	

*Schedule of proposals received August, 1899, for constructing an addition to almshouse.*

Bidder.	Amount.	If cement mortar is used add—	If side porch be omitted deduct—
John Hughes, jr.....	\$14,725.00	\$98.60	\$528.51
Landvoight & Kimmel.....	16,000.00	500.00	1,114.00
D. F. Mockabee.....	14,845.00	180.00	960.00

*Schedule of proposals for constructing an assembly hall on grounds of Reform School for Boys, opened March 7, 1900.*

Bidder.	Amount for building.	Amount for electric wiring.	Total.
Pavarini & Greer.....	\$11,463.65	\$465.00	\$11,928.65
Burgess & Parsons.....	11,290.00	255.00	11,545.00
John Hughes, jr.....	13,286.00	434.50	13,720.50

# 150 OPERATIONS OF THE ENGINEER DEPARTMENT, D. C.

*Schedule of proposals for constructing truck house for fire department on S street NW., between Thirty-fourth and Thirty-fifth streets, opened July 29, 1899.*

Bidder.	Amount.	Additional cost—			
		If front is laid with standard-size brick, No. 164.	If Roman brick is used on 3 sides.	If plastering walls and wainscoting in truck room is omitted.	If first story over cellar is made fire-proof.
Wm. S. Spencer .....	\$20,779.00	\$580.00	\$580.00	\$420.00	.....
D. F. Mockabee .....	19,511.00	.....	.....	.....	.....
C. Thomas .....	19,500.00	405.00	545.00	.....	\$270.00
G. W. Corbett <sup>1</sup> .....	18,889.00	405.00	270.00	500.00	620.00

<sup>1</sup> Specifications did not accompany bid of G. W. Corbett.

*Schedule of proposals for constructing truck house for fire department on Whitney avenue, between Thirteenth and Fourteenth streets NW., opened July 29, 1899.*

Bidder.	Amount.	Additional cost—			
		If front is laid with standard-size brick, No. 164.	If Roman brick is used on 3 sides.	If plastering walls and wainscoting in truck room is omitted.	If first story above cellar is made fire-proof.
D. F. Mockabee .....	\$15,854.00	.....	.....	.....	.....
Wm. S. Spencer .....	18,604.00	\$360.00	\$590.00	\$500.00	.....
W. E. Speir .....	16,300.00	.....	.....	350.00	\$700.00
G. W. Corbett <sup>1</sup> .....	15,907.00	380.00	225.00	460.00	600.00

<sup>1</sup> Specifications did not accompany bid of G. W. Corbett.

*Proposals for constructing truck house on Whitney avenue NW., between Thirteenth and Fourteenth streets NW., opened September 2, 1899.*

Bidder.	Amount.
Gleeson & Humphrey .....	\$15,900.00
John Hughes .....	12,498.00

*Schedule of proposals for constructing truck house on S street, between Thirty-fourth and Thirty-fifth streets, opened September 2, 1899.*

Bidder.	Amount.
D. F. Mockabee .....	\$16,782.00
Gleeson & Humphrey .....	17,400.00
John Hughes .....	12,498.00

*Proposals for constructing truck house for fire department on S street NW., between Thirty-fourth and Thirty-fifth streets, opened January 27, 1900.*

Bidder.	Price.
J. M. Dunn .....	\$15,929.00
John Hughes, jr. ....	15,869.00
Cranford Paving Co. ....	16,000.00

**OPERATIONS OF THE ENGINEER DEPARTMENT, D. C. 151**

*Schedule of proposals for construction and installation of a steam-heating apparatus in additional building at Girls' Reform School, opened August 5, 1900.*

Bidder.	Amount.	Remarks.
Zellers & Co.....	\$3,439.00	No deposit.
Gills & Geoghegan.....	5,000.00	
E. Rutzler.....	4,531.00	
Weaver & Hoffman.....	3,745.00	
Blake & Williams.....	3,745.00	
The Warren W. Biggs Heating and Ventilating Co.....	3,291.00	

*Schedule of proposals for constructing two steam boilers and connections for Franklin School, opened August 31, 1899.*

Bidder.	Amount.
Forsberg & Murray.....	\$3,289.00
Warren W. Biggs Heating and Ventilating Co.....	2,269.00
Bennett & French.....	2,364.00

*Schedule of proposals for constructing boiler room and repairing heating apparatus on grounds smallpox hospital, opened September 2, 1899.*

Bidder.	Amount.
Forsberg & Murray.....	\$1,325.00
Warren W. Biggs Heating and Ventilating Co.....	1,530.00

*Schedule of proposals for repairs to and changes in plumbing in Central and Colored High School buildings, opened August 5, 1899.*

Bidder.	Amount.
E. J. Hannan.....	\$5,595.00
S. S. Shedd & Bro.....	5,890.00
	6,097.00

*Schedule of proposals for repairs to and changes in plumbing in Summer School building, opened August 21, 1899.*

Bidder.	Amount.
S. S. Shedd & Bro.....	\$9,548.00
Wm. Rathwell.....	8,444.00
James Nolan & Sons.....	7,240.00
Edw. J. Hannan.....	7,997.00

*Schedule of proposals for repairs and changes in plumbing in Banneker School building, opened March 10, 1900.*

Bidder.	Amount.
E. J. Hannan.....	\$3,961.96
James Nolan & Sons.....	3,685.00
S. S. Shedd & Bro.....	3,579.40

*Schedule of proposals for repairs to and changes in plumbing in Grant School, opened June 27, 1900.*

Bidder.	Amount.
E. J. Hannan.....	\$3,726.00
S. S. Shedd & Bro.....	3,573.00
James Nolan & Sons.....	3,525.00

# 152 OPERATIONS OF THE ENGINEER DEPARTMENT, D. C.

*Proposals for erecting two gatehouses at Brightwood Reservoir, opened May 19, 1900.*

Bidder.	Amount.
J. F. Manning & Co.....	\$15,998.00
D. F. Mockabee.....	25,915.00

*Schedule of proposals for excavating on site for new pumping station, opened June 9, 1900.*

Bidder.	Price.	Cost.
Geo. S. Post.....	\$0.30	\$4,500.00
Lyons Bros.....	.23	3,450.00
M. F. Talty.....	.21	3,150.00
Andrew Gleeson.....	.14½	2,212.50

*Schedule of proposals for quarrying and crushing stone, opened June 16, 1900.*

	Stone loaded in cars, per cubic yard.	Stone delivered in piles, per cubic yard.	Stone loaded from piles to cars, per cubic yard.	Total.
<b>Standard Lime and Stone Co.:</b>				
One year.....	\$1.20	\$1.20	.....	\$43,500.00
Two years.....	1.15	1.15	.....	41,745.00
Three years.....	1.10	1.10	.....	39,900.00
Five years.....	.98	.98	.....	35,574.00
<b>J. C. Regan &amp; Co.:</b>				
One year.....	1.00	1.10	\$1.10	40,200.00
Two years.....	.97	1.07	1.07	39,072.00
Three years.....	.95	1.05	1.05	38,280.00
Five years.....	.90	1.00	1.00	36,300.00

*Schedule of proposals for furnishing terra-cotta sewer pipe and invert blocks, opened August 14, 1899.*

Material.	The Freeman Fire Clay Co.	Angus La-mond.	Mack Manufacturing Co.	The Potomac Terra Cotta Co.	Akron Sewer Pipe Co. <sup>1</sup>	Thos. Somerville & Sons.	Savage Fire Brick Co.	J. H. Gulick.
<b>Terra-cotta sewer pipe:</b>								
24-inch.....	.....	.....	\$0.59	\$0.65	\$0.87½	\$0.64	.....	.....
21-inch.....	.....	.....	.45	.58	.....	.60	.....	.....
18-inch.....	\$0.51	.....	.....	.84	.42½	.33	.....	.....
15-inch.....	.35	.....	.....	.25	.31½	.24½	.....	.....
12-inch.....	.21½	\$0.15½	.....	.17	.21½	.16	.....	.....
10-inch.....	.16½	.....	.13	.15	.16½	.15½	.....	.....
8-inch.....	.11½	.....	.08½	.09½	.11½	.09	.....	.....
6-inch.....	.07½	.....	.10	.06½	.07½	.06	.....	.....
<b>Terra-cotta Y branches:</b>								
24 by 6 inch.....	.....	.....	2.50	3.30	3.95	3.45	.....	.....
21 by 6 inch.....	.....	.....	2.10	2.50	.....	2.80	.....	.....
18 by 6 inch.....	2.30	.....	1.40	1.70	1.91	1.75	.....	.....
15 by 6 inch.....	1.58	.....	1.10	1.25	1.40	1.30	.....	.....
12 by 6 inch.....	.96	.....	.75	.85	.96	.89	.....	.....
10 by 6 inch.....	.73	.....	.....	.70	.73	.77	.....	.....
8 by 6 inch.....	.50	.....	.....	.45	.50	.40	.....	.....
<b>Terra-cotta reducers, 8 to 6 inch.....</b>	.45	.....	.....	.38	.45	.40	.....	.....
<b>Terra-cotta sewer bends:</b>								
6-inch.....	.27½	.21½	.....	.24	.27½	.22	.....	.....
8-inch.....	.45	.35	.....	.38	.45	.35	.....	.....
<b>Vitrified sewer invert blocks</b>	.....	.84	.50	.60	.....	.58	.....	.....
<b>Vitrified sewer invert bricks.....</b>	.....	.....	.....	.....	.....	.....	\$17.75	\$18.40

<sup>1</sup> Bid withdrawn August 12, 1899.

# OPERATIONS OF THE ENGINEER DEPARTMENT, D. C. 153

*Schedule of proposals for furnishing vitrified paving block, opened June 2, 1900.*

Bidder.	Number per square yard.	Whole, per thousand.	Half, per thousand.	Cost per square yard for whole block.
American Clay Manufacturing Co.....	42	\$21.42	\$14.00	\$0.899
Guise Brick and Stone Co.....	44	22.50	15.00	.99
Eastern Paving Brick Co.....	43	23.50	15.00	1.010
Mack Manufacturing Co.....	42	24.00	19.00	1.008
W. W. Clark & Son .....	{	125.00	.....	.....
		\$20.00	.....	.....
		\$22.00	.....	.....

<sup>1</sup> Johnsonburg blocks.

<sup>2</sup> Johnsonburg bricks.

<sup>3</sup> Perkiomen bricks.

*Schedule of bids received June 2, 1900, for vitrified sewer invert blocks, vitrified sewer invert bricks, terra-cotta sewer pipe, reducers and bends, and Y branches.*

Material.	The Potomac Terra Cotta Co.		Angus Lamond.		John Jackson.		Mack Manufacturing Co.		American Clay Manufacturing Co.	
	Amount.	Price.	Amount.	Price.	Amount.	Price.	Amount.	Price.	Amount.	Price.
Terra-cotta sewer pipe:	<i>Lin. ft.</i>		<i>Lin. ft.</i>		<i>Lin. ft.</i>		<i>Lin. ft.</i>		<i>No.</i>	
24-inch.....	3,300	\$0.684	.....	.....	1,700	\$0.76	.....	.....	.....	.....
21-inch.....	5,000	.55	.....	.....	4,000	.584	.....	.....	.....	.....
18-inch.....	8,000	.357	.....	.....	4,000	.394	.....	.....	.....	.....
15-inch.....	8,000	.274	.....	.....	4,000	.294	.....	.....	.....	.....
12-inch.....	16,000	.19	5,000	\$0.154	3,000	.194	.....	.....	.....	.....
10-inch.....	6,000	.144	.....	.....	3,000	.15	.....	.....	.....	.....
8-inch.....	.....	.....	2,700	.084	.....	.....	.....	.....	.....	.....
6-inch.....	.....	.....	6,000	.054	.....	.....	.....	.....	.....	.....
Terra-cotta Y branches:										
24 by 6 inch.....	1	3.25	.....	.....	.....	.....	.....	.....	.....	.....
21 by 6 inch.....	1	2.27	.....	.....	.....	.....	.....	.....	.....	.....
18 by 6 inch.....	1	1.67	.....	.....	.....	.....	.....	.....	.....	.....
15 by 6 inch.....	1	1.23	.....	.....	.....	.....	.....	.....	.....	.....
12 by 6 inch.....	200	.82	.....	.....	100	.894	.....	.....	.....	.....
10 by 6 inch.....	200	.63	.....	.....	100	.68	.....	.....	.....	.....
8 by 6 inch.....	1	.44	.....	.....	.....	.....	.....	.....	.....	.....
Terra-cotta reducers, 8 to 6 inch.....	25	.36	.....	.....	.....	.....	.....	.....	.....	.....
Terra-cotta bends:										
6-inch.....	.....	.....	.....	.20	.....	.....	.....	.....	.....	.....
8-inch.....	.....	.....	.....	.33	.....	.....	.....	.....	.....	.....
Vitrified sewer invert blocks.....	.....	.....	.....	.....	.....	.....	1,050	\$0.40	.....	.....
Vitrified sewer invert bricks.....	.....	.....	.....	.....	.....	.....	.....	.....	900,000	\$16.75

*Schedule of proposals for furnishing sand and gravel, opened July 29, 1899.*

Bidder.	Paving and concrete.	Building.	Gravel.
Columbia National Sand Dredging Co.....	\$0.50	\$0.75	\$0.82
John B. Lord <sup>1</sup> .....	.55	.75	.75

<sup>1</sup> John B. Lord failed to submit samples as required by specifications.

# 154 OPERATIONS OF THE ENGINEER DEPARTMENT, D. C.

*Proposals received June 2, 1900, for furnishing sand and gravel.*

Bidder.	Paving and con- crete sand.	Building sand.	Screened gravel.
L. E. Smoot .....	\$0.50	\$0.575	\$0.55
John B. Lord .....	.60	.75	.55
Columbia National Sand Dredging Co. ....	.55	.70	.55

*Schedule of bids received for furnishing red sewer brick, opened June 2, 1900.*

	Standard Brick Co.
In city of Washington .....	\$0.55
In city of Georgetown .....	1.25
In county of Washington, east of Eastern Branch .....	1.25
In county of Washington, between Eastern Branch and Rock Creek .....	1.25
In county of Washington, west of Rock Creek .....	11.45
At bidder's works .....	4.45
For hauling beyond limits for each mile or fraction of mile .....	.50

*Schedule of bids received June 2, 1900, for furnishing red sidewalk paving brick.*

Bidder.	Price per thousand.
Standard Brick Co. ....	\$11.00
Frederick Brick Works. ....	11.15

*Schedule of proposals for furnishing granite curbing, opened August 7, 1899.*

Bidder.	6 by 20 inches, straight, per foot.	6 by 20 inches, circular, per foot.	8 by 8 inches, straight, per foot.	8 by 8 inches, circular, per foot.
Brantley Granite Co .....	\$0.65	\$0.80	\$0.55	\$0.70
Francis Jones & Co .....	.675	.875	.575	.75
The Brandywine Granite Co. ....			.59	.75
John Merrick Horn .....	.76	.95	.63	.77
A. B. Cook <sup>1</sup> .....	.80	1.10	.74	1.00
	.84		.78	
	.88		.84	
	1.00		.90	
Venable Bros .....	.85	1.30	.70	1.20
McIvain Unkefer Co. ....	.875	1.16	.78	1.12
George Peirce .....	.97	1.19	.77	.97

<sup>1</sup> Proportionate quantities.

*Schedule of proposals for furnishing granite curbing, opened June 2, 1900.*

Bidder.	6 by 20 inches, straight, per foot.	6 by 20 inches, circular, per foot.	8 by 8 inches, straight, per foot.	8 by 8 inches, circular, per foot.
Francis Jones & Co .....	\$0.745	\$0.95	\$0.62	\$0.75
Brantley Granite Co .....	.775	1.00	.675	.80
A. B. Cook .....	.94	1.35	.84	1.20
Geo. Peirce .....	.97	1.46	.85	1.20

# OPERATIONS OF THE ENGINEER DEPARTMENT, D. C. 155

*Proposals for furnishing granite coping for Brightwood reservoir, opened August 10, 1899.*

Bidder.	Cost.
Antonio Mainati .....	\$4,427.00
Albert Weber .....	4,590.00
John Merrick Horn .....	5,170.00
George Peiros .....	6,501.00
Bodwell Granite Co .....	6,664.00
Gulford and Waltersville Granite Co. ....	6,700.00
George C. Esher .....	8,850.00
Amberg Granite Co .....	8,500.00
J. F. Manning & Co .....	6,987.00

## *Schedule of proposals for furnishing Portland cement.*

[Bids opened October 7, 1899.]

Bidder.	Brand.	Price.
Alex Y. Hanna & Co. ....	Teutonia .....	\$2.58
Sparrow Friedenber & Co .....	Climax .....	2.5387
	Germania .....	2.62
J. H. McGill .....	Atlas .....	
	Vulcanite .....	
	Norovetti .....	3.00
Cranford Paving Co .....	Any acceptable brand .....	

## *Schedule of bids received for furnishing Portland cement, opened June 2, 1900.*

Bidder.	Price per barrel.
Lehigh Portland Cement Co .....	\$2.09
Alpha Portland Cement Co .....	2.12
James H. McGill .....	2.14
The Cranford Paving Co .....	2.14
Coplay Cement Co .....	2.15
The Brennan Construction Co .....	2.17
J. G. Waters & Son .....	2.17
Sparrow Friedenber & Co .....	2.208

## *Schedule of bids received June 2, 1900, for furnishing natural hydraulic cement.*

Bidder.	Price per barrel.
National Mortar Co .....	\$0.71
James H. McGill .....	.73

## *Schedule of bids for furnishing macadam stone for Brightwood avenue, opened October 5, 1899.*

	Daily delivery.	Price per cubic yard on road.	Price per cubic yard on cars.	Total bid.
	Yards.			
Cranford Paving Co .....	50	\$2.45	.....	\$12,250.00
C. G. Smith & Son .....	50	2.30	.....	11,500.00
Standard Lime and Stone Co .....	100	.....	\$1.34	6,700.00
				18,450.00

<sup>1</sup> Total price on the road.

## 156 OPERATIONS OF THE ENGINEER DEPARTMENT, D. C.

*Proposals for furnishing 1,500 linear feet cast-iron pipe, opened October 21, 1899.*

Bidder.	Per ton.	Cost.	Delivery.
Camden Iron Works.....	\$29.60	\$4,440.00	On wharf.
U. S. Cast Iron Pipe and Foundry Co.....	29.90	4,485.00	On cars.
M. J. Drummond & Co.....	30.00	4,500.00	Do.

NOTE.—U. S. Cast Iron Pipe and Foundry Company, if by boat, navigation permitting, 50 cents per ton less.

*Schedule of proposals for furnishing two 36-inch check valves, opened May 26, 1900.*

Bidder.	Cost each.	Total.
Frank W. Dilks.....	\$855.00	\$1,710.00
Eddy Valve Co.....	800.00	1,600.00
Michigan Brass and Iron Works.....		1,700.00
Rensselaer Manufacturing Co.....		598.00

*Schedule of bids for hauling, received June 2, 1900.*

Bidder.	Sand, per cubic yard.	Gravel, per cubic yard.	Paving bricks, per M.	Paving blocks, per M.	Curbing.		Pipe, per ton.
					6 by 20 inches.	8 by 8 inches.	
In the city of Washington:							
Littlefield, Alvord & Co.....	\$0.40	\$0.40	\$1.19	\$1.69	\$0.05	\$0.04	\$0.60
Frederick Springmann.....	.60	.60	1.45	1.90	.07	.05	.60
Geo. W. Knox Express Co.....			1.20	1.70	.05	.04	.50
Merchants' Parcel Delivery Co.....							.56
In the city of Georgetown:							
Littlefield, Alvord & Co.....	.49	.49	1.33	1.90	.05	.04	.70
Frederick Springmann.....	.75	.75	1.60	2.15	.09	.07	.50
Geo. W. Knox Express Co.....			1.30	1.90	.05	.04	.50
Merchants' Parcel Delivery Co.....							.56
In county of Washington, east of Eastern Branch:							
Littlefield, Alvord & Co.....	.40	.40	1.19	1.69	.05	.04	.60
Frederick Springmann.....	.60	.60	1.35	1.90	.07	.05	.50
Geo. W. Knox Express Co.....			1.30	1.90	.05	.04	.65
Merchants' Parcel Delivery Co.....							.56
In county of Washington, between Eastern Branch and Rock Creek, not farther than 1½ miles from city limits:							
Littlefield, Alvord & Co.....	.49	.49	1.32	1.95	.05	.04	.70
Frederick Springmann.....	.70	.70	1.55	2.10	.08	.07	.65
Geo. W. Knox Express Co.....			1.60	2.00	.07	.05	.65
Merchants' Parcel Delivery Co.....							.56
In county of Washington, west of Rock Creek, not farther than 1 mile from limits of city of Georgetown:							
Littlefield, Alvord & Co.....	.49	.49	1.30	1.90	.05	.04	.70
Frederick Springmann.....	.85	.85	1.70	2.25	.10	.07	.65
Geo. W. Knox Express Co.....			1.60	2.00	.07	.05	.65
Merchants' Parcel Delivery Co.....							.66
Additional hauling. For deliveries at points other than described above (to be added to price for deliveries at nearest point described above), for each additional mile or fraction of mile:							
Littlefield, Alvord & Co.....	.09	.09	.19	.30	.01	.01	.08
Frederick Springmann.....	.16	.16	.25	.40	.03	.02	.10
Geo. W. Knox Express Co.....			.20	.35	.01	.01	.10
Merchants' Parcel Delivery Co.....							.10
Unloading from cars and hauling broken stone a not greater distance than 1 mile from point of unloading, for cars delivered within city limits and Eckington yard:							
Littlefield, Alvord & Co.....		.34					
Frederick Springmann.....		.45					
Geo. W. Knox Express Co.....		.50					

# OPERATIONS OF THE ENGINEER DEPARTMENT, D. C. 157

## Statement of contracts for furnishing construction material for the fiscal year 1900.

No.	Date.	Name and address of contractor.	To furnish—
882	July 7, 1899	Standard Brick Co., Washington, D. C.	Red sewer brick.
885	July 10, 1899	Julia H. Guise, Williamsport, Pa.	Vitrified paving blocks.
720	Aug. 26, 1899	Washington Asphalt Block and Tile Co., Washington, D. C.	Asphalt paving blocks.
721	Aug. 29, 1899	J. Merrick Horn, Wilmington, Del.	Granite coping.
726	Aug. 31, 1899	Potomac Terra Cotta Co., Washington, D. C.	Terra-cotta material.
728	Sept. 5, 1899	Angus Lamond, District of Columbia	Do.
729	Sept. 2, 1899	Savage Fire Brick Co., Keystone Junction, Pa.	Sewer invert bricks.
730	Aug. 21, 1899	Columbia National Sand Dredging Co., Virginia.	Sand.
731	Aug. 29, 1899	Thos. Somerville & Sons, Washington, D. C.	Terra-cotta material.
733	Sept. 12, 1899	Mack Manufacturing Co., New York City	Do.
734	Sept. 12, 1899	John B. Lord, Washington, D. C.	Gravel.
735	Sept. 5, 1899	Brantley Granite Co., Lithonia, Ga.	Curbing.
738	Oct. 1, 1899	Standard Lime and Stone Co., Baltimore, Md.	Macadam stone.
739	Oct. 18, 1899	Jas. H. McGill, Washington, D. C.	Portland cement.
747	Nov. 13, 1899	United States Cast Iron Pipe and Foundry Co., Philadelphia, Pa.	Cast-iron water pipe.
859	June 16, 1900	John A. Roebling Sons Co.	Telegraph cable.
864	June 14, 1900	Standard Underground Cable Co., Pittsburg, Pa.	Combination cable.
865	June 15, 1900	Michigan Brass and Iron Works, Detroit, Mich.	Swing check valves.
772	June 26, 1900	John H. Jackson, Albany, N. Y.	Terra-cotta material.
773	June 23, 1900	Chesapeake and Potomac Telephone Co., Washington, D. C.	Telephone cable.
779	June 27, 1900	Potomac Terra Cotta Co., Washington, D. C.	Terra-cotta material.
780	June 30, 1900	Frederick Brick Works, Frederick, Md.	Paving bricks.

## Statement of contracts for the construction of sewers for the fiscal year 1900.

No.	Date.	Name and address of contractor.	Location.	To construct—
880	July 6, 1899	Adam McCandlish, Washington, D. C.	Pennsylvania avenue NW., between Fifteenth street and Madison place.	Brick sewer.
			Madison place, between Pennsylvania avenue and Opera House.	Do.
			Alley, square 221.	Pipe sewer.
			Sixth street NW., between New York avenue and K street.	Do.
			New York avenue NW., between Sixth and Seventh streets.	Do.
			K street NW., between Sixth and Seventh streets.	Do.
			D street SE., between Twelfth and Thirteenth streets.	Do.
			D street SE., between Fourteenth and Fifteenth streets.	Do.
			New York avenue NW., east from Fifth street.	Do.
			C street NW., between Twelfth and Thirteenth streets.	Do.
			Twelfth street NW., between C and D streets.	Do.
			Thirteenth street NW., between C and D streets.	Do.
			New Jersey avenue SE., between C and D streets.	Do.
2683	June 30, 1899	M. McNamara & Co., Washington, D. C.	Industrial Home School ...	Pipe sewer and sewage-disposal field.
2713	Aug. 10, 1899	Andrew Gleason, Washington, D. C.	Quincy street, between Seventh street and Brightwood avenue.	Brick sewer.
			Trinidad street, across lands of W. S. Clark.	Do.
			Zoological Park.	Pipe sewer.
			Ontario avenue, between Rock Creek and Lanier avenue.	Do.
			Kansas avenue, between Ontario avenue and Adams' Mill road.	Do.

## 158 OPERATIONS OF THE ENGINEER DEPARTMENT, D. C.

*Statement of contracts for the construction of sewers for the fiscal year 1900—Continu*

No.	Date.	Name and address of contractor.	Location.	To construct-
2713	Aug. 10, 1899	Andrew Gleeson, Washington, D. C.	Adams' Mill road, between Kansas and Lanier avenues.	Pipe sewer.
			Lanier avenue, between Adams' Mill road and Ontario avenue.	Do.
2742	Oct. 27, 1899	E. G. Gummel .....	Thirty-fifth street NW., between Madison and Georgetown and Rockville road; also Georgetown and Rockville road, between Thirty-fifth street and Tunlaw road.	Do.
2743	Oct. 13, 1899	John Jacoby .....	East side intercepting sewer, between site for pumping station, foot of New Jersey avenue and Twelfth street SE.	Brick sewer.
			East side intercepting sewer, between Twelfth SE. and Twenty-first and A streets NE.	Do.
2744	Nov. 1, 1899	Adam McCandlish .....	First street NE., between D and F streets.	Pipe sewer.
			Eighteenth street NW., between Kenesaw avenue and Grant street.	Do.
			Grant street, between Seventeenth and Eighteenth streets.	Do.
			Thirty-fifth street NW., between Q and T streets.	Do.
2746	Nov. 8, 1899	Warren F. Brenizer .....	Thirty-seventh street NW., between W and Y streets; Y street NW., between Thirty-seventh and Thirty-eighth streets.	Brick sewer.
2769	June 27, 1900	Andrew Gleeson .....	North Capitol, between G and I streets.	Do.
2776	June 29, 1900	Peyton D. Vinson .....	Klingler Ford and Woodley roads, west of Connecticut and Wisconsin avenues.	Pipe sewer.
2777	June 29, 1900	.....do .....	U street NW., between North Capitol and First streets; T street NW., between North Capitol and First streets; Brandywine street, between Seventh and Fifth streets; Fifth street, between Brandywine and Des Moines streets.	Do.

*Statement of contracts for general supplies for the fiscal year 1900.*

Date.	Name and address of contractor.	To furnish—
July 1, 1899	Southern Electric Co., Baltimore, Md .....	Electrical supplies.
do	Rudolph West & Co., Washington, D. C. ....	Tinware.
do	Jordan & Christie, Boston, Mass .....	Hardware.
do	Frank Hume, Washington, D. C. ....	Groceries.
July 5, 1899	Metropolitan Job Printing Office, New York, N. Y. ....	Blank forms.
do	Mackall Brothers, Washington, D. C. ....	Drugs.
July 6, 1899	W. B. Moses & Sons, Washington, D. C. ....	Furniture.
do	do .....	Do.
July 7, 1899	W. J. C. Dulany, Baltimore, Md .....	School books.
do	R. Carter Ballantyne, Washington, D. C. ....	Stationery.
do	W. J. C. Dulany, Baltimore, Md .....	Do.
June 30, 1899	B. Rich & Sons, Washington, D. C. ....	Boots and shoes.
July 1, 1899	Rudolph West & Co., Washington, D. C. ....	Hardware.
June 27, 1899	Chas. White & Co., Washington, D. C. ....	Miscellaneous castings.
do	Church & Stephenson, Washington, D. C. ....	Lumber.
June 30, 1899	W. M. Galt & Co., Washington, D. C. ....	Groceries.
July 3, 1899	Geo. F. Muth & Co., Washington, D. C. ....	Glass, paints, and varnish.
July 1, 1899	J. C. Ergood Co., Washington, D. C. ....	Groceries.
July 17, 1899	A. P. Smith Manufacturing Co., Newark, N. J. ....	Plumbers' materials.
July 24, 1899	Thos. Somerville & Sons, Washington, D. C. ....	Do.
do	do .....	Do.
July 12, 1899	S. S. Daish & Sons, Washington, D. C. ....	Forage.
do	do .....	Fuel.
July 21, 1899	T. T. Keane, Washington, D. C. ....	Fresh meat and corned beef.
July 25, 1899	Standard Oil Co., Washington, D. C. ....	Glass, paints, and varnish.
July 28, 1899	Blum Brothers, Washington, D. C. ....	Furniture, B.
do	do .....	Dry goods.
do	do .....	Furniture, C.

*Statement of contracts for the improvement of streets, avenues, and roads for the fiscal year 1900.*

Date.	Name and address of contractor.	Location.	Character of work.
July 14, 1899	Geo. B. Mullin, Washington, D. C. ....	Albemarle street, between Thirty-eighth and Grant road.	Grading.
do	E. G. Gummel .....	Kenesaw avenue and Park road.	Do.
do	M. F. Talty .....	Michigan avenue, between North Capitol and Lincoln avenue.	Do.
Sept. 13, 1899	M. McNamara & Co. ....	Rock Creek Park to Brightwood avenue.	Grade roadway.
do	do .....	Rock Creek Park .....	Grade roadway in.
Sept. 15, 1899	Matthew Myers .....	Twenty-second and Twenty-fourth streets, Langdon.	Grade.
Sept. 30, 1899	Cranford Paving Co. ....	Where ordered .....	Cement sidewalks.
Nov. 4, 1899	M. F. McNamara & Co. ....	Thirty-seventh street (Burleith), between Y and Back streets.	Grade.
May 15, 1900	Andrew Gleeson .....	I street S.E., between South Capitol and New Jersey avenue.	Pave and set curb.
May 29, 1900	do .....	Pennsylvania and Branch avenues.	Grade.
June 26, 1900	Peyton D. Vinson .....	Kansas avenue, from Utica street northward.	Do.
do	Geo. B. Mullin .....	Connecticut avenue west of Rock Creek.	Grade and improve.
do	Cranford Paving Co. ....	Where ordered .....	Renewing, resurfacing, and repairing asphalt pavements.

## 160 OPERATIONS OF THE ENGINEER DEPARTMENT, D. C.

*Statement of construction, hauling, and miscellaneous contracts for the fiscal year 1900.*

No.	Date.	Name and address of contractor.	Description.
2686	July 13, 1899	Fredk. Springmann, Washington, D. C.	Haul water pipes, valves, and special castings.
2695	June 29, 1899	Georgetown Gas Light Co., Washington, D. C.	Furnish and maintain gas lighting west of Rock Creek.
2696	July 5, 1899	Belmont Iron Works, Philadelphia, Pa.	Furnish and deliver lamp posts.
2697	July 14, 1899	Potomac Electric Power Co., Washington, D. C.	Operate, repair, and maintain incandescent electric lamps.
2701	July 3, 1899	Michigan Brass and Iron Works, Detroit, Mich.	Furnish and deliver check valves.
2702	July 12, 1899	Mohawk and Hudson Manufacturing Co., Waterford, N. Y.	Furnish and deliver valves.
2709	Aug. 7, 1899	Washington Gas Light Co., Washington, D. C.	Furnish gas, operate and maintain "Collis" lamps.
2710	July 31, 1899	Gleeson & Humphrey, Washington, D. C.	Construct 8-room school building on Kenyon street, Columbia Heights.
2711	Aug. 14, 1899	Edward J. Hannan, Washington, D. C.	Repair and change plumbing in Central and Colcord High Schools.
2712	Aug. 5, 1899	H. I. Gregory	Furnish and set ready for use heating and ventilating appliance for school-house on Kenyon street, Columbia Heights.
2719	Aug. 29, 1899	James Nolan & Sons, Washington, D. C.	Repair and change plumbing, Sumner School.
2723	Sept. 14, 1899	Forsberg & Murray, Washington, D. C.	Construct boiler room and repair heating apparatus, smallpox hospital.
2724	Aug. 25, 1899	Pavarini & Greer, Washington, D. C.	Construct additional building, Girls' Reform School.
2725	Aug. 29, 1899	W. W. Biggs Heating and Ventilating Co., Washington, D. C.	Furnish and set steam heating apparatus, Girls' Reform School.
2727	Sept. 2, 1899	D. F. Mockabee, Washington, D. C.	Construct addition to Alms House.
2736	Sept. 27, 1899	Forsberg & Murray, Washington, D. C.	Changes and repairs to heating apparatus, Industrial Home School.
2740	Oct. 25, 1899	U. S. Electric Lighting Co., Washington, D. C.	Furnish, operate, and maintain arc-lighting service.
2741	Oct. 25, 1899	Potomac Electric Power Co., Washington, D. C.	Do.
2748	Feb. 7, 1899	John Hughes, Jr., Baltimore, Md.	Construct truck house, 8 street NW., between Thirty-fourth and Thirty-fifth.
2749	Mar. 20, 1900	S. S. Shedd & Bro., Washington, D. C.	Repair and change plumbing, Banneker School building.
2750	Apr. 6, 1900	Chas. T. Holloway & Co., Baltimore, Md.	Manufacture and deliver chemical fire engine.
2752	May 24, 1900	La France Fire Engine Co., Elmira, N. Y.	Furnish and deliver Hayes extension-ladder truck and fire escape.
2754	June 9, 1900	J. C. Regan & Co., Joliet, Ill.	Construct complete the Brightwood reservoir.
2755	June 15, 1900	Andrew Gleeson, Washington, D. C.	To complete excavation for new pumping station on Trumbull street, between First and Fourth.
2756	June 14, 1900	Robert V. Rusk, Washington, D. C.	To collect ashes.
2757	June 8, 1900	Lawrence S. Nicolai, Washington, D. C.	Naphtha lighting.
2758	June 18, 1900	Washington Gas Light Co., Washington, D. C.	Street lighting.
2760	June 14, 1900	Robert V. Rusk, Washington, D. C.	Collect miscellaneous refuse.
2761	do	do	Collect night soil.
2762	do	do	Sweep and clean alleys.
2763	do	do	Sweep and clean streets.
2766	June 19, 1900	Lilly & Robinson, Indianapolis, Ind.	Street sweeping.
2767	do	do	Hauling.
2768	June 25, 1900	La France Fire Engine Co., Elmira, N. Y.	Furnish and deliver Hayes extension-ladder truck and fire escape.
2775	June 29, 1900	James Nolan & Sons, Washington, D. C.	Repair and change plumbing in Grant School building.
2778	June 25, 1900	Fredk. Springmann, Washington, D. C.	Hauling.

# INDEX.

	Page.
<b>Alleys:</b>	
Report of Engineer Commissioner .....	8
Paved under permit system .....	98
Paved under assessment system .....	100
<b>Asphalt and cements:</b>	
Report of inspector of .....	121
Asphaltic surface mixture .....	125
Paving, inspection of .....	124-125
Wearing surface .....	129
Proposals for laying asphalt pavements .....	148
<b>Assessment work:</b>	
Sewers .....	41-46
Sidewalks, curbs, and alleys in city .....	100
Sidewalks, curbs, and alleys in county .....	100
Basins and connections, flushing of .....	41-65
<b>Bridges:</b>	
Report of Engineer Commissioner .....	4
Report of engineer of .....	114
Care of .....	115
Construction and repair of .....	115
<b>Buildings and building inspection:</b>	
Report of Engineer Commissioner .....	7
Report of Capt. D. D. Gaillard .....	19
Report of inspector of buildings .....	69
Permits issued and receipts .....	69-70
School buildings .....	8
Report of inspector of elevators .....	74
<b>Cements:</b>	
Report of inspector of asphalt and cements .....	121
Tests of natural and Portland cements .....	121-122
Proposals to furnish .....	155
<b>Chief clerk:</b>	
Engineer department, report of .....	143
Water department, report of .....	87
<b>Computing engineer, report of, and accompanying tables .....</b>	<b>78-81</b>
Table A.—Street railways in the District of Columbia, July 1, 1900 .....	
B.—Statement of character and extent of street pavements, July 1, 1900 .....	
C.—Statement of mileage of street pavements, July 1, 1900 .....	
D.—Descriptive list of street pavements, giving character, extent, cost, etc. ....	
E.—Schedule of work on streets and avenues and county roads and suburban streets .....	
F.—Repairs to asphalt and concrete pavements for year ended June 30, 1900 .....	
G.—Work done at cost of railroad companies .....	81-111
H.—Work done by day labor under appropriation for "Current repairs to streets, avenues, and alleys" .....	
I.—Regular permit work .....	
K.—Assessment work .....	
L.—Replacing and repairing sidewalks and curbs around public reservations .....	
M.—Miscellaneous work .....	
N.—Whole cost work .....	
O.—Repairs to cuts by plumbers and others .....	

	Page
<b>Contracts:</b>	
For streets and roads, 1900 .....	159
For sewers .....	157
For construction materials .....	157
For construction, hauling, miscellaneous .....	160
For supplies .....	159
<b>Elevators, report of the inspector of</b> .....	74
<b>Employees:</b>	
Temporary, first division .....	66
Temporary, second division .....	112
On bridges and roads .....	112
In sewer and property divisions and engineer stables .....	66
<b>Engineer of bridges, report of</b> .....	114
<b>Flushing basins and connections</b> .....	41-45
<b>Highway-extension plans:</b>	
Report of Engineer Commissioner .....	10
Report of Assistant Engineer W. P. Richards .....	122
<b>Materials:</b>	
Report of superintendent of property .....	124
Construction, kind and cost of .....	125
Contracts for furnishing .....	160
Proposals for furnishing .....	152-155
<b>Miscellaneous work:</b>	
Streets .....	107
Sewers .....	64
<b>Parking commission:</b>	
Report of Engineer Commissioner .....	9
Report of superintendent of .....	119
<b>Pavements:</b>	
Report of Engineer Commissioner .....	2
Granite block .....	86
Vitrified brick .....	82
Asphalt block .....	82
Adjacent to railway tracks .....	92
<b>Report of computing engineer—</b>	
Concrete, repairs to .....	91
Laid at cost of street railways .....	92
Character and area of .....	81
Mileage of .....	81
Report of superintendent of streets .....	80
Repairs to plumbers' cuts .....	111
Cuts in by plumbers et al., charges for repairing .....	111
Proposals for .....	142, 144
<b>Permits:</b>	
Report of permit clerk .....	127
List of, issued during year .....	127
<b>Permit work:</b>	
Sidewalks, alleys, curbs, in city .....	92
Sidewalks, alleys, curbs, in county .....	92
Sewers .....	41-46
<b>Plumbers:</b>	
Cuts in pavements, repair of .....	111
Charges against, for cuts in pavements, etc .....	111
<b>Plumbing:</b>	
Report of Capt. D. D. Gaillard .....	19
Report of inspector of .....	66
Yard hydrant inspection .....	67
Plumbing regulations .....	67
Plumbing in public schools .....	67
Prosecutions .....	68
Public-comfort stations .....	68
<b>Plumbing board, report of</b> .....	66
<b>Property:</b>	
Report of superintendent of .....	124
Pumping station for sewers, plan for .....	42
(Also see Materials.)	

333575

MAY '01

# REPORT

OF THE



## PERATIONS OF THE ENGINEER DEPARTMENT

OF THE

## DISTRICT OF COLUMBIA

FOR

THE YEAR ENDING JUNE 30, 1901,

UNDER THE DIRECTION OF

CAPTAIN LANSING H. BEACH, CORPS OF ENGINEERS, U. S. A.,  
ENGINEER COMMISSIONER, DISTRICT OF COLUMBIA.



WASHINGTON:  
GOVERNMENT PRINTING OFFICE,  
1901.

VDDA

	Page.
Streets:	
Report of Engineer Commissioner .....	8
Report of computing engineer .....	78
Mileage of paved .....	81
Character and area of pavement of .....	81
Report of superintendent of .....	80
Current repairs to .....	94
Miscellaneous work on .....	107
Repairs to plumbers' cuts in .....	111
Repairs to suburban streets .....	112
Subdivision of land, report of Assistant Engineer W. P. Richards .....	133
Superintendent of property, report of .....	134
Superintendent of roads, report of .....	111
Superintendent of sewers, report of .....	49
Superintendent of streets, report of .....	84
Superintendent of repairs .....	75
Superintendent of water department .....	21
Surveyor's office .....	116
Report of surveyor .....	116
Temporary employees:	
In first division .....	66
In second division .....	113
On roads and bridges .....	113
In sewer and property divisions and engineer stables .....	66
Tests of engineering materials:	
Report of inspector of asphalt and cements .....	121
Cement, natural and Portland .....	122
Sand .....	126
Asphaltic mixtures .....	125
Water .....	124
Trees. (See Report of parking commission).	
Water, analysis of .....	194
Water registrar and chief clerk, report of .....	37
Water service:	
Report of Engineer Commissioner .....	7
Report of Capt. D. D. Gaillard .....	18
Distribution .....	32
Meters .....	40
Mains laid during the year .....	32
Revenue and inspection branch .....	37
Report of superintendent .....	21-32, 36
Mains .....	28
Length, size, and cost of mains laid during year .....	32
Length, size, and cost of mains laid between 1878 and 1900 .....	35
Cost of laying mains .....	33-36
Daily consumption of water .....	36
Pumped during year .....	22
Pumped per day, mean .....	22
Coal burned .....	22
Cost of pumping during year .....	22
Gravity system .....	22
Trunk mains, lengths and sizes .....	25
Areas to be supplied by high service .....	26-27
Cost per foot for laying mains .....	26
Cost of mains laid for high service from July 1, 1893 .....	26
Report of water registrar and chief clerk .....	37
Receipts and expenditures during year .....	38
Premises supplied with Potomac water .....	39
Revenues—	
Comparative statement of .....	38
Miscellaneous water takers .....	39
Well water, analysis of .....	124
Whole cost work:	
Streets, roads, etc .....	110
Sewers .....	40-47

339575

MAY 16 08

REPORT

OF THE



PERATIONS OF THE ENGINEER DEPARTMENT

OF THE

DISTRICT OF COLUMBIA

FOR

THE YEAR ENDING JUNE 30, 1901,

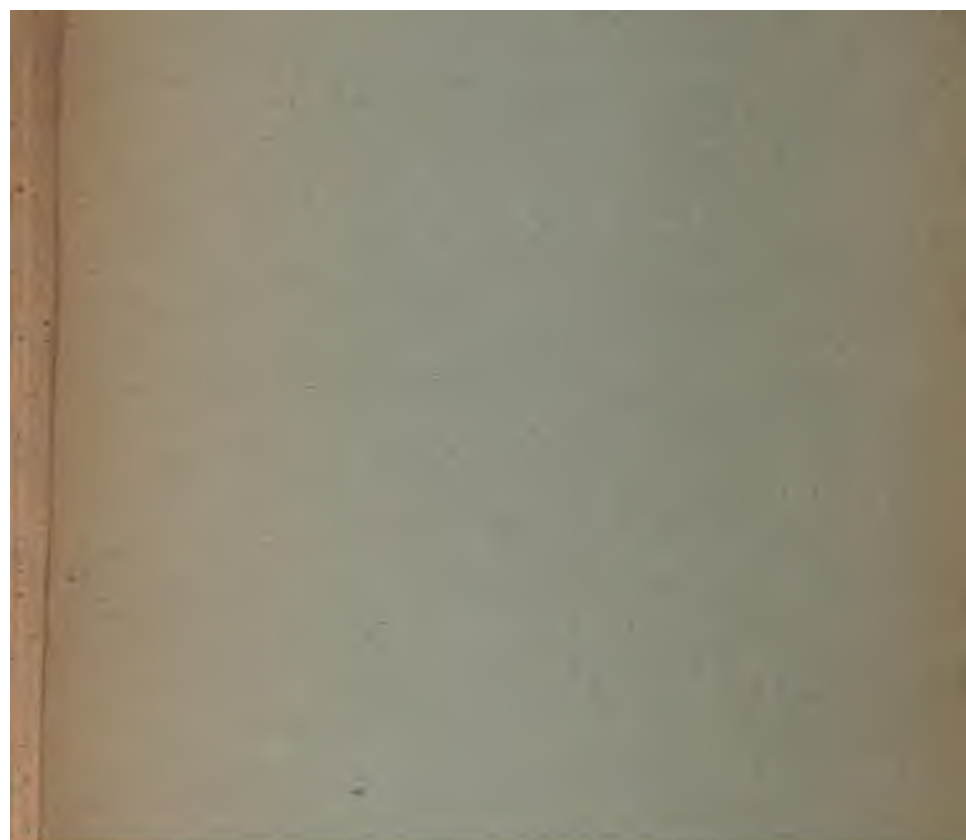
UNDER THE DIRECTION OF

CAPTAIN LANSING H. BEACH, CORPS OF ENGINEERS, U. S. A.,  
ENGINEER COMMISSIONER, DISTRICT OF COLUMBIA.



WASHINGTON:  
GOVERNMENT PRINTING OFFICE.  
1901.

VDDA



**REPORT**  
**OF THE**  
**OPERATIONS OF THE ENGINEER DEPARTMENT**

**OF THE**  
**DISTRICT OF COLUMBIA**

**FOR**  
**THE YEAR ENDING JUNE 30, 1901,**

**UNDER THE DIRECTION OF**  
**CAPTAIN LANSING H. BEACH, CORPS OF ENGINEERS, U. S. A.,**  
**ENGINEER COMMISSIONER, DISTRICT OF COLUMBIA.**



**WASHINGTON:**  
**GOVERNMENT PRINTING OFFICE.**  
**1901.**

330575

330575

EXTRACT FROM THE REPORT OF THE COMMISSIONERS OF THE  
DISTRICT OF COLUMBIA FOR THE YEAR ENDED JUNE 30, 1901.

OFFICE OF THE COMMISSIONERS  
OF THE DISTRICT OF COLUMBIA,  
*Washington, November 1, 1901.*

The PRESIDENT:

The Commissioners of the District of Columbia herewith submit, for the information of Congress, as required by law, their annual report of the official doings of the government of said District for the fiscal year which ended June 30, 1901.

\* \* \* \* \*

OPERATIONS OF THE ENGINEER DEPARTMENT.

During the fiscal year the engineer department was under the charge of Capt. Lansing H. Beach, Corps of Engineers, U. S. A. He had as assistants Capt. D. D. Gaillard, Capt. H. C. Newcomer, and Capt. Chester Harding, of the Corps of Engineers. Captain Gaillard served until March, 1901, when he was ordered to take charge of the engineer office at Duluth, Minn., and was succeeded here by Captain Harding.

STEAM RAILROADS.

The Commissioners feel it to be a cause of congratulation that the District is at last to have railroad facilities in keeping with the dignity of the national capital. Congress has passed acts requiring the abolition of grade crossings, the removal of the Long Bridge, and the erection of suitable terminal facilities for the city within five years. Plans for a part of these great undertakings have already been prepared and submitted to the Commissioners for approval, and approved, as required by law.

Shortly after the passage of the acts of Congress referred to above, the Pennsylvania Railroad Company secured a controlling interest in the Baltimore and Ohio Company. This change of relations between the two companies has brought apparently within reach still further improvements long desired by those who have the welfare of the city at heart. A union station, accommodating all steam railroads entering the city, together with the clearance of tracks and stations from the Mall, in addition to the abolition of grade crossings, seem to be within sight.

It is believed that the Pennsylvania Railroad Company is willing to do its share in accomplishing these desired objects. Shortly after the consolidation of interests referred to above, its officers intimated to the Commissioners that they were aware there was more or less sentiment in favor of the establishment of a union passenger station in Washing-

ton and they realized it would be desirable to have such a station, if the same could be established in fairness to all the railroad interests and the public, although the problem was a very difficult one to work out. They suggested that the only proposition they had been able to figure out, that would be satisfactory to all interests, would be to connect the Baltimore and Ohio Railroad lines on Delaware avenue with the Pennsylvania tracks on Virginia avenue by means of a double-track tunnel from the ground just north of C street NE., thence following the line of First street east to B street south, thence curving into Virginia avenue near First street west. This would permit the establishment of a through station on the site of the Baltimore and Ohio Railroad Company's terminal property at Delaware avenue and C street NE., and would contemplate the rebuilding of the Baltimore and Potomac Railroad through Washington as already authorized by Congress, with the exception of the branch and station on the Mall.

A large union station could thus be provided on an eligible site, with a through station and a stub station—the railway company deeming the latter a necessary essential in Washington—because the bulk of the traffic from the North stops at Washington, and the bulk of the traffic from the South also stops at Washington, but, of course, it would be necessary to have a through connection for the through North and South passenger trains, as otherwise it would mean a long detour.

The Commissioners at once took up the matter and a study was made of the project as outlined above. No insurmountable engineering difficulties were found to be in the way, and the Commissioners feel safe in stating that the project is not only entirely feasible, but that it offers a practical solution of two problems that have confronted the city for years, namely, the clearance of the Mall of railroad obstructions and the erection of a union station accommodating all railroads entering the city; and they recommend that the necessary legislation be enacted at as early a date as possible to secure these great improvements in terms which shall be satisfactory to the District of Columbia.

#### STREET AND ALLEY PAVEMENTS.

The materials used for street pavements during the year were asphalt, asphalt block, and macadam; 40,832 square yards of sheet asphalt, 17,353 square yards of asphalt block, and 82,806 square yards of macadam being laid. This was all new work upon streets heretofore unprovided with improved pavement. In connection and addition to the above, 306,000 cubic yards of grading was accomplished. The prices paid were, for sheet asphalt on 6-inch concrete base, \$1.79½ per square yard, and for asphalt block on gravel base, \$1.77 per square yard. For the coming year the prices will be \$1.72 for sheet asphalt and \$1.77 for asphalt block.

Vitrified block and asphalt block were used for paving alleys, about 12,000 square yards of the former and 13,000 square yards of the latter being laid. This work was done by day labor.

The recommendation is renewed that all granite-block pavements in the city be replaced as rapidly as possible with sheet asphalt or asphalt block. Objections to the rough and noisy granite-block pavements are being continually received, and under the conditions prevailing in Washington, where smooth pavements are the rule, it is believed that relief should be afforded.

## SIDEWALKS.

During the year 67,176 square yards of cement sidewalk were laid, and 4,035 square yards of brick sidewalk. The prices for cement sidewalk were \$1.05½ and \$1.18¼ per square yard, the latter price prevailing upon streets in the county not provided with roadway pavements. For the coming year the prices will be 89 cents and \$1.07 per square yard, respectively.

The amount of brick walk laid has steadily decreased from year to year. The first cost of a brick walk is but little less than one of cement, while the advantages of the latter are incomparably greater. It is almost impossible to maintain a smooth brick sidewalk in Washington on account of tree roots which grow up under the pavement and displace the bricks. The cement walk, however, is not so easily affected, although with some variety of trees—notably the Carolina poplar—the surface growth of roots is often sufficient to lift even the heavy blocks of cement. Largely on this account, as well as on account of other undesirable qualities, the Carolina poplars are removed when new sidewalks are laid contiguous to them, and a better kind of tree planted in their places.

The office has been embarrassed in a number of cases during the year by a judicial decision to the effect that real estate exempted by law from the payment of general taxes is, by the same law, also exempt from special assessments. As the office has no means at its command to pay for laying a walk in front of such property, the result has been that when such a frontage was encountered arrangements have had to be made with the property owners for the execution of the work upon a deposit by them of one-half the estimated cost, in advance, as otherwise the pavement in front of such premises would have to be omitted. This has, in several cases, caused serious inconvenience to the public, and badly needed work has had to be left undone. It is believed that no exemptions whatever from assessment for work of improvement should be made and that when any property receives the benefit of new curb, sidewalk, sewers, or alley paving, it should bear its proportional half of the cost and not throw the entire expense upon the taxpayers.

## BRIDGES.

Attention is again respectfully invited to the need of a better bridge in place of the present navy-yard bridge over the Anacostia River. The present bridge was built in 1875. It is unsightly, much too narrow, and structurally unfit for the heavy traffic imposed upon it. The recommendation is renewed that it be replaced by a modern structure at as early a date as possible.

The act making appropriations for the sundry civil expenses of the Government for the fiscal year 1901 contained the following item under the head of Zoological Park:

For the construction of a bridge across Rock Creek on the line of the roadway from Quarry road entrance, under the direction of the Engineer Commissioner of the District of Columbia, \$22,000, one-half of which shall be paid out of the revenues of the District of Columbia.

The old bridge was built of timber and iron and was in an unsafe condition. Plans for the new bridge were prepared by the Melan Arch Construction Company, under the direction of this office, and the

bridge has been completed, with the exception of sidewalks and the grading of the creek, for which purpose a balance of \$775 of the appropriation remains available. The bridge is constructed of concrete throughout with a cement mortar face. It consists of a single arch of 80-foot span with a roadway 19 feet wide and two 6-foot sidewalks.

Under the emergency appropriation to repair damages done by the storm of June 2, 1900, a concrete-steel bridge with granite face has been erected over Piney Branch on the line of the drive along Rock Creek in place of the bridge washed away. The new bridge has a span of 24 feet and a roadway 23 feet wide.

Contract has also been entered into for the construction of a concrete arch bridge over Broad Branch on the line of Argyle road. This work is now in progress. The bridge will have a span of 24 feet and a roadway 23 feet wide. Mr. Glenn Brown, assisted the office in preparing the plans for this work.

The \$40,000 appropriated on account of the Connecticut avenue bridge across Rock Creek will enable the office to complete the foundations of all the piers, from two to nine inclusive.

Fifty thousand dollars was provided on account of work on the Massachusetts avenue bridge over Rock Creek. This makes a total of \$225,000 for the bridge and will be sufficient to complete it. It is expected that the masonry arch of the bridge will soon be completed, after which a fill of 250,000 cubic yards will be necessary in order to provide a roadway over the arch, which is constructed as a very large culvert.

#### SEWAGE DISPOSAL PROJECT.

Under the appropriation for the "Preparation of detailed plans and specifications for sewage disposal system complete" the survey for the various trunk sewers, the inverted siphon crossing the Anacostia River, and the pumping station have been completed. The surveys for land to be acquired for the construction of the outfall sewer have not been fully completed.

The sizes, gradients, and sections of the trunk sewers and inverted siphon have been designed and the estimates of cost have been made. Detailed sheets of the various portions of the work and specifications for the same are being prepared, and they will be completed in all probability within the present fiscal year. The work upon the project has followed the general lines indicated in the report of the Board of Sanitary Engineers of 1890, with such modifications as additional study of the situation indicated.

For example, the amount of rainfall to be provided for by the large trunk sewer in B street and New Jersey avenue has been increased, thereby increasing the size of that sewer and also the capacity of the pumping machinery at the pumping station. The line has been changed from B street eastward at Tenth street to avoid the crowded streets adjacent to the Center Market and the Pennsylvania Railway station, the new line crossing the Mall and joining the line originally proposed in Third street near Maryland avenue. The outlet section of the Four-and-a-half street sewer has been changed in location from M street to L street. The location for the inverted siphon has been changed, so that its axis is about normal with the proposed channel lines, and its length has been considerably reduced. Several trunk lines have been added to the project. First, a trunk sewer to provide the properties

within the low section of the city adjacent to Pennsylvania avenue NW., between First and Fifteenth streets, with adequate sewerage facilities for cellars; second, the extension of the east side intercepting sewer from Twelfth street east to Twenty-first street; third, the extension of the northeast boundary sewer from its present outlet to a point near Twenty-first and A streets NE. Work is now in progress upon the east side intercepting sewer, the extension of the boundary sewer, the lower section of the sewer to drain the low area, and the outlet section of the Tiber Creek and New Jersey avenue high-level intercepting sewer.

A contract for furnishing the pumps, boilers, and appurtenances for the pumping station has been made with the Allis-Chalmers Company, of Milwaukee.

Messrs. Didden & Vogt were engaged, after an open competition, as architects to prepare plans for the pumping station.

The estimated amount required to complete the project, in addition to the amounts heretofore appropriated, is \$2,620,097.50.

The expenditures to date on account of completed work aggregate \$520,473.04.

The appropriation to date on account of work in progress aggregates \$1,362,000.

#### STREET RAILWAYS.

Under the provisions of acts of Congress the Capital Traction Company extended its lines eastward on Pennsylvania avenue from Eighth street SE. to the Anacostia River; also along F and G streets from Seventeenth street westward to Twenty-fifth and Twenty-sixth streets and thence north to Pennsylvania avenue; also on First street NE. between B and C streets. These lines have been completed and are now in operation.

A great many complaints have been received during the year on account of the abandoned street-railway tracks in various parts of the city. The office has been in communication with the railway companies for a year or more, endeavoring to have the tracks removed, with the result that the work has at last been undertaken.

The law requiring the removal of abandoned tracks imposes a fine of only \$10 a day for each day the tracks are permitted to remain after a sixty days' notice to remove them, a penalty entirely inadequate to command the respect of the railway companies or to accomplish the purpose of the law. It is believed the fine should be at least \$100 a day instead of \$10, and in addition that the law should provide that upon failure of the company to perform the work directed, within a prescribed time, the District should have authority to do it, issuing certificates of indebtedness against the companies in payment of the expense involved.

#### BUILDINGS AND BUILDING INSPECTION.

The report of Mr. John B. Brady, inspector of buildings, for which see page 146, gives detailed information concerning building operations during the year.

Numerous complaints were received during the year from builders and architects of the inconvenience and loss of time incurred in securing permits and having plans examined in the office of the inspector of

buildings. This was largely due to the utter inadequacy of the force of the office to meet the heavy demands upon it, and partly to the system made necessary by the law concerning permits for projections beyond the building line. Since the first of the present fiscal year the office force has been somewhat augmented, as provided for by Congress, and the conditions are considerably better than they were formerly, although the force is still insufficient to properly attend to the business of the office, and in the annual estimates increases have been recommended which are believed to be necessary for the good of the service.

With regard to projections beyond the building line, the law provides that permits for these shall be issued only upon the concurrence of the three Commissioners and the Secretary of War. Each application has to go through the following routine: First, it is submitted to the inspector of buildings, who sees that it conforms to the building regulations and then forwards it to the Commissioners, by whom it is individually approved if considered advisable, and then the application is sent to the Secretary of War; he returns it to the office of the Commissioners, and, if approved, the building inspector thereupon issues the permit. This process takes from a week to ten days—a delay which causes a great deal of irritation to those applying for the permit. But, inasmuch as the permit finally obtained gives the applicant the use of a piece of Government land absolutely free of charge, it is believed that the cases can not be too closely scrutinized, especially in view of the fact that the tendency is to take every square inch that can possibly be obtained under the schedule of projections, and quite often to try to secure still more.

The Commissioners believe that it has proved a mistake to grant projections as liberally as has been done in the past. It is the rare exception that anyone builds a house without taking advantage of the privilege of obtaining a few feet of land without cost, and the result is that many of the streets of Washington which were noted for their breadth and beauty are now lined with long rows of bay windows and their width considerably reduced.

#### STREET TREES.

The history of tree planting in Washington is embraced in a period covered by the last thirty years, as previous to 1871 trees were planted without system and generally at individual expense. On account of the wide roadways and scattered improvements, trees were located near the houses and were few in number. The narrowing of the roadways and the planting of trees along the curb line was inaugurated by a public act approved April 6, 1870.

The present system of tree planting under the District authorities was instituted in September, 1871, by the board of public works, and all trees now at the curbs have been put there since that date. A commission, consisting of William R. Smith, William Saunders, and John Saul, acted, by request, as an advisory board during the early years of planting. The report of this commission in 1872 recommended as best for curbstone trees the silver maple, the American linden, European sycamore maple, the American elm, the tulip tree, the sugar maple, the sweet gum, the red maple, the Norway maple, the negundo, the American ash, and the plain trees. During later years

(since August, 1884) Mr. Trueman Lanham has acted as superintendent of parking, having charge of the planting and care of street trees and making a close study of the work under his supervision.

These thirty years of tree planting furnish a thorough test of the varieties of trees best adapted to city streets, and as a result of this experience there has been a gradual evolution in regard to the selection of trees as well as in their care and the mode of planting.

Trees are now spaced much farther apart, and more care is taken in supplying rich soil around the roots. Because of frequent attacks from insects or on account of destructive effect on pavements certain varieties are being removed or replaced as fast as circumstances allow. Trees classed as quick growers are now demanding great attention, as they are generally short lived and need close trimming to prevent breaking by storms or early decay.

The Carolina poplar, the locust, the negundos, and the aspen poplar are all objectionable as city trees, the first named being very destructive to pavements and sewers, while the last two are continually subject to attacks by caterpillars. The constant removal of trees necessitated by the above conditions or by the widening of roadways or sidewalks has caused an agitation for the planting of larger and more fully developed trees. Paris has been cited as an example of such work, where old trees, it is claimed, are transplanted with success. The report of the parking commission for the year 1872 mentions the removal of 60 large trees and states that the operation is not commended. It is quite possible to remove large trees with success where they are planted in a park or field or where the question of expense is not considered. It can hardly be made a success, however, where trees are planted close to the curb; and the expense attending the mere planting of such trees would be enormous, because of the improvements in the sidewalk and roadway which would have to be removed and replaced. It can also be stated that under the most favorable conditions in removing large trees the results are not worth the expense, as such trees are short lived and rarely healthy.

No fair comparison can be made between the methods of planting in Paris and those that prevail in this city. Paris, with a population many times larger than Washington, cares for less trees and expends double the amount of money in their culture. Here tree planting is general, covering the entire city; there it is confined to parks and wide avenues. Certain publications on Paris trees state that each tree represents an expenditure of \$50. Here each tree stands for an expense of \$6. As a comparison of results it may be stated that close observers of both cities have pronounced the trees of Washington to be superior in foliage, healthfulness, and general appearance. There is no doubt, however, that the present appropriations are too small to give the trees here the care and attention required, the yearly allowance per tree being only about 25 cents. The trees now cared for by the District number about 80,000.

In conclusion, it is deemed only fitting to acknowledge the good work of the assistants and of the clerical force of the various departments of the office, who have not spared themselves in carrying out their duties to the best of their ability.

Very respectfully,

HENRY B. F. MACFARLAND,  
JOHN W. ROSS,  
LANSING H. BEACH,

*Commissioners of the District of Columbia.*



# REPORT OF THE OPERATIONS OF THE ENGINEER DEPARTMENT.

## SURFACE DIVISION.

Capt. H. C. NEWCOMER,

*Corps of Engineers, United States Army, Assistant to the Engineer Commissioner, in charge.*

STREETS, PAVEMENTS, GRADES, AND CONSTRUCTION OF ROADS,	CONWAY B. HUNT, <i>Computing Engineer.</i>
SIDEWALKS AND ALLEYS.....	H. N. MOSS, <i>Superintendent of Streets.</i>
MAINTENANCE OF COUNTY ROADS.....	MORRIS HACKER, <i>Superintendent of Roads.</i>
CONSTRUCTION AND CARE OF BRIDGES.....	WALTER J. DOUGLAS, <i>Engineer of Bridges.</i>
SURVEYOR'S OFFICE.....	H. B. LOOKER, <i>Surveyor, District of Columbia</i>
PARKING COMMISSION.....	TRUEMAN LANHAM, <i>Superintendent of Parking.</i>

## REPORT OF ASSISTANT IN CHARGE.

OFFICE OF THE ENGINEER COMMISSIONER,  
DISTRICT OF COLUMBIA,  
*Washington, September 24, 1901.*

CAPTAIN: I have the honor to transmit herewith annual reports giving in detail the operations during the fiscal year ending June 30, 1901, of the surface division, the surveyor's office, and the parking commission, namely, report of the computing engineer, including reports of the superintendent of streets, superintendent of roads, and the engineer of bridges; report of the surveyor, District of Columbia; and report of the superintendent of parking.

In submitting these reports I desire to invite attention to a few matters of special importance affecting the work under my charge.

The computing engineer refers to the difficulty attending assessment work, such as setting new curb, laying sidewalks, or paving alleys, when it abuts property owned by churches and other organizations exempt from taxation. The law provides that one-half the cost of such work must be paid by the owners of abutting property, either by deposit prior to execution of work or through subsequent assessment and collection. The Commissioners are empowered to order the execution of such work when it is required in the interests of public health, safety, or comfort. The District court of appeals decided October 25, 1899, that property such as that described above is exempt from special assessment for local improvements as well as from general taxation. The authorities are powerless, therefore, in such cases to do work of this character unless the parties representing the property voluntarily deposit the half cost in advance. This they sometimes refuse to do, and thus prevent work that is much needed in the interests of the general public. It is recommended that necessary legislation be secured to permit the assessment of such property in the same manner as private property for work of this character.

The report of the surveyor of the District of Columbia invites attention to the manner in which the operations of his office are hampered by the failure to provide in the annual appropriation bill a sufficient sum to meet the demands of an ever-increasing volume of work. This requires each year that the regular appropriation be supplemented by provision made in the deficiency bill. The needs of

the office are so well defined and the importance of the work so obvious that adequate provision for its annual maintenance should be made in the regular appropriation bill in the same manner as for other departments.

The urgent need of larger appropriations for the parking commission must be apparent to anyone familiar with the extent of its work. There are some 82,500 trees already planted and in need of frequent attention. To cultivate these trees, to replace those dying or destroyed, to protect the younger ones with wooden boxes and the older ones with wire netting, to trim the trees suitably, to protect them from the ravages of destructive worms and insects, would alone more than exhaust the usual appropriations if the trees received all the care needed for their best development. Already there are frequent criticisms of the work that are unjust only because they demand more from the officials in charge than available funds will enable them to do. Besides the trees, which constitute the chief object of the commission's work, there is the care of parking spaces which makes ever-increasing demands upon the limited funds. Moreover, the growth of the city inevitably leads to most urgent requests for extensions in the lines of trees, and the newer sections should not be deprived of this feature that constitutes one of the principal elements in the beauty of the city. It is confidently believed that no other expenditure of an equal amount could contribute as much to the comfort and pleasure of residents and guests in the city, and it is earnestly recommended that increased appropriations be made commensurate with the needs and importance of the work.

Very respectfully,

H. C. NEWCOMER,

*Captain, Corps of Engineers, U. S. A.,*

*Assistant to Engineer Commissioner District of Columbia.*

Capt. LANSING H. BEACH,

*Corps of Engineers, U. S. A.,*

*Engineer Commissioner District of Columbia.*

## REPORT OF THE COMPUTING ENGINEER, DISTRICT OF COLUMBIA.

WASHINGTON, D. C., July 1, 1901.

CAPTAIN: I have the honor to submit the following report of the operations of the surface division of the engineer department of the District of Columbia for the fiscal year ended June 30, 1901:

*Summary statement of work under appropriations for "Improvement and repairs" and "Construction of county roads and suburban streets."*

	Improve- ment and repairs.	County roads and suburban streets.	Paving roadways, permit system.	Total.
Asphalt, 6-inch base.....square yards..	20,756.53	17,612.35	2,463.92	40,832.80
Vitrified-block gutters.....do.	4,482.41	2,761	396.76	7,640.17
Asphalt block.....do.	10,483.52	-----	6,870.11	17,353.63
Macadam.....do.	41,025	41,781	-----	82,806
Cobble gutters.....do.	14,423.54	11,134	-----	25,557.54
Ordinary grading.....cubic yards..	33,195	259,212	7,850	391,257
Macadam grading.....do.	4,116	1,733	-----	5,849
Old cobble removed.....do.	12,188	1,148	-----	13,336
Old curb removed.....do.	10,971.22	49.40	-----	11,020.62
Curb set.....do.	39,309.07	8,510.30	-----	47,819.37
Curb reset.....do.	7,495.15	156.91	-----	7,652.06

In the report of the superintendent of streets all day-labor work under the appropriation for "Repairs to streets" is consolidated. It seems proper to segregate certain items of work, which are accordingly itemized as follows: The roadway of Bates street, between First street W. and North Capitol street, was macadamized and provided with cobble gutters; the roadway of B street NE., from Twelfth to Fourteenth streets, was graveled and provided with cobble gutters; general repairs were made to the asphalt block roadways of D street SE., from Second to Third streets; Seventh street NE., from North Carolina avenue to East Capitol street, and Maryland avenue NE., from Eighth to Twelfth streets; the roadway of S street NW., from Thirty-fourth to Thirty-fifth streets, was macadamized and provided with cobble gutters; the roadway of L street SW., from Second to

Four-and-a-half streets, was spiked, graveled, and rolled; the roadway of E street SE., from Sixth to Seventh streets, was generally repaired and rolled and the gutters relaid; the roadway of Sixth street NE., between L and M streets, was regraveled and the cobble gutters relaid; the roadways of F street NE., between Thirteenth and Fourteenth streets, and of Fourteenth street NE., between E and F streets, were macadamized and provided with cobble gutters; the roadway of U street NW., adjacent to the Western High School grounds, between Thirty-fifth and Thirty-sixth streets, was macadamized and provided with cobble gutters; the roadway of G street NE., from Fourteenth to Florence streets, was graveled and rolled and provided with cobble gutters; the roadway of First street SW., from N to V streets, was spiked, graveled, and macadamized and rolled; the roadway of Fourteenth street NE., from F street to Maryland avenue, was macadamized and provided with cobble gutters; the roadway of I street SW., between First street and Delaware avenue, was macadamized and the gutters relaid; the roadway of Twelfth street NE., from C street to Maryland avenue, was macadamized and provided with cobble gutters, and the roadways of Virginia and Georgia avenues SE., between Ninth and Eleventh streets, and of Ninth street SE., from Georgia to Virginia avenues, were macadamized and rolled and the gutters relaid.

The principal items of work under the appropriation "Repair to roads" were: The grading of Providence street between Thirteenth and Fifteenth streets; the macadamizing of Trinidad street, in King's subdivision of Trinidad; the macadamizing of Concord street between Tenth and Thirteenth streets, Brookland; the macadamizing of Flint street, Brightwood Park; the macadamizing of Klinge road from Linnean Hill road to Rock Creek, and the macadamizing of Newark street from Wisconsin avenue eastward.

The following is a list of tables appended with this report:

Table A.—Street railways in the District of Columbia, July 1, 1901.

B.—Statement of character and extent of street pavements, July 1, 1901.

C.—Statement of mileage of street pavements, July 1, 1901.

D.—Descriptive list of street pavements and suburban roadways, giving character, extent, cost, etc.

E.—Schedules of work on streets and avenues and county roads and suburban streets.

F.—Repairs to asphalt and concrete pavements for year ended June 30, 1901.

G.—Work done at cost of railroad companies.

H.—Work done by day labor under appropriation for "Current repairs to streets, avenues, and alleys."

I.—Regular permit work.

L.—Replacing and repairing sidewalks and curbs around public reservations.

M.—Miscellaneous work.

N.—Whole cost work.

O.—Repairs to cuts by plumbers and others.

As an incident to the expenditure, by contract, of the bulk of the appropriation for "Improvement and repairs," "Repairs to concrete pavements," and "Construction of county roads," and on account of other appropriations not under the control of the surface division, there were executed miscellaneous items of work by day labor during the year, as shown in detail in Table M. This work amounted to \$39,703.64.

The reports of the superintendent of streets, superintendent of roads, and the engineer of bridges are transmitted herewith.

Under a special authorization contained in the current appropriation bill, bids were received for operating the District quarry at Dickerson, Md., for terms of one, two, three, and five years, and a contract for a five-year term was executed with the Standard Lime and Stone Company, of Baltimore, Md., Mr. Daniel Baker, president, at very advantageous rates. Under this contract the quarry was operated during the past year with a largely increased output over the preceding year, due in a large part to the peculiar circumstance that under the operation of the schedule for improvement and repairs a large amount of macadam had to be supplied on streets provided to be graded and regulated. For the ensuing and succeeding years the number of graded and regulated streets on the schedule are relatively few, and the demands on the quarry from this source will be very greatly reduced. On the other hand, it is hoped that appropriations for repairs to streets and repairs to roads will be of such proportions as will enable full advantage to be taken of this large supply of first-class construction material at a practically constant rate.

Another provision of the current appropriation bill which resulted in large practical advantages was that which authorized the transfer to the credit of a

succeeding fiscal year of the unexpended balances of the appropriations for paving roadways under the operation of the schedule whenever such balances were insufficient to complete the paving of the next square that would be reached on the schedule. In addition to the advantages directly to the office, it is confidently believed that this provision will work to the advantage of the contractor for street paving in that the limit of his work can be more definitely foreseen, and that this fact will redound to the District's benefit in the price bid for future work.

A notable item of paving work within the city was the widening of the roadway of G street NW. from Fifth to Seventh streets, from Ninth to Tenth streets, and from Fourteenth to Fifteenth streets, to a width uniform with that of the balance of the street—50 feet. Most of this work was done under the provision of a special appropriation therefor, but the square between Fifth and Sixth streets, not being included in that appropriation, was authorized from the general appropriation for "Repairs to streets," and the result of these operations has been a great public convenience.

The operations of grading streets, alleys, and roads by the labor of the inmates of the Washington Asylum, although economically conducted, were of necessity suspended, for lack of funds, before the expiration of the fiscal year, leaving a long list of authorized but unfinished work. As this work is at present administered so many advantageous improvements can be accomplished that would otherwise be practically impossible that in the interest of economy the appropriation should be increased from \$8,000 to \$10,000, as it is found that this latter sum is necessary to keep a well-proportioned force continuously employed throughout the year.

On account of its notably defective condition the large paved area of roadway at the intersection of Louisiana avenue, Seventh and C streets, was resurfaced during the year and advantage was taken of this general treatment of the locality to create a circular park about 100 feet in diameter, occupying the center of the intersection, with convenient roadways around it, resulting in a distinct improvement in appearances and in every other respect, and at a reduced cost of construction over the repaving of the entire original roadway.

The appropriation for "Repairs to streets" was expended on the general lines followed during preceding years, and the resurfaced streets are among the best in the District. The other asphalt and coal-tar pavements were maintained by minor repairs in excellent condition, no reasonable expense being spared. The cost of such minor repair work during the year was \$40,454.38.

The general appropriation for "Construction of county roads" for the current year contained 16 separate subheads. For the ensuing fiscal year this same general appropriation contains 25 subheads. As each subhead is specific as to the location and limits of the work for which it provides, a very great practical advantage and both direct and indirect economy would result if legislative authorization could be secured that the total of the general appropriation shall be disbursed and accounted for as "Construction of county roads," and for that purpose it shall constitute one fund. Precedent for this is found in the case of "Subsistence of the Army" (act of March 2, 1901), and the analogy therefor in the appropriations made in our annual appropriation bills for paving streets in the various sections under the operations of the improvement and repair schedule. The practical difficulties of making from 16 to 25 separate estimates conform in execution to the needs of each street without excess or deficit in any item are very great. These could all be avoided without any additional cost if the provision recommended be made. It can be stated that this recommendation has the concurrence of the District accounting officers.

The sum of \$3,000 for the improvement of Adams's Mill road, which was reappropriated by Congress, was expended during the year in bringing this road to the approved grade, including in these operations the area of the original road and such additional area as could be secured with the appropriation of \$5,000 (similarly reappropriated), for the purchase and condemnation of land necessary to widen the road in accordance with the plans for street extensions.

The appropriation act for 1901 contained an item for \$10,000 for paving roadways under the permit system. Such a provision has been made in previous years, but had been interrupted for several successive years, and its renewal was marked by an immediate pressure for the allotments that could be made within the limits of the appropriation to such an extent that a much larger sum could have been advantageously and easily expended.

The streets paved during the year under this appropriation were S street NW., from Phelps place to Twenty-third street; Flagler place, from U to Albany streets; and Baltimore and Twentieth streets, from Nineteenth street to Cincinnati street.

The extension of the lines of the Capital Traction Company eastward along Pennsylvania avenue, from Eighth street to the Eastern Branch; along F and G

streets, from Seventeenth street westward; and along Twenty-fifth and Twenty-sixth streets northward to Pennsylvania avenue; and on First street NE., between B and C streets, were all completed during the year, in accordance with legislative authorization.

The detailed plans prepared in accordance with the public act of February 12, 1901, for the elimination of grade crossings on the lines of the Pennsylvania Railroad, were approved by the Commissioners of the District on June 1, 1901. Active construction operations on this work are anticipated in the near future.

In the execution of assessment work serious embarrassment has resulted from the judicial decision that property exempted by law from general taxes is likewise exempt from special assessments. This office has not understood that the appropriation for assessment work could properly be expended in front of such property in view of this decision, and the result has been that when such a frontage is encountered arrangements have had to be made with the owners of such property for the execution of the work in their frontages under the permit system by the deposit of the half cost in advance, or else the work on these frontages has had to be omitted, causing more or less, and frequently quite serious, public inconvenience.

The current routine work of the office has been kept up to date during the year, and my acknowledgments are due to the force engaged for the results accomplished.

C. B. HUNT,

*Computing Engineer, District of Columbia.*

Capt. LANSING H. BEACH,

*Corps of Engineers, U. S. A.,*

*Engineer Commissioner, District of Columbia.*

(Through Capt. H. C. Newcomer.)

---

#### REPORT OF THE SUPERINTENDENT OF STREETS.

WASHINGTON, *July 1, 1901.*

SIR: I have the honor to submit herewith the annual report of the operations under my charge for the fiscal year ended June 30, 1901.

Table H is a summary of work done (by day labor, except cement sidewalks) under the appropriation for "Current repairs to streets, avenues, and alleys." The cost of this work was \$26,392.09. Of this amount about one half was sidewalk and alley work and the other half repairs to street roadways.

During the year there were 2,524 dangerous holes repaired, aggregating 24,365 square yards, at a total cost of \$9,341.72.

Table I is a list of work done under the permit system, by which the property owners requested the improvements and paid one half the cost, the District paying the other half. Total, \$24,360.13.

Table K is a list of work done under the assessment system; one-half the cost of work ordered under this system is charged against the abutting property, and becomes a lien upon said property. Total cost of such work was \$179,421.61.

Table L is a list of the work done out of the appropriation for "Replacing and repairing sidewalks and curbs around public reservations and municipal buildings." The amount expended under this head was \$7,040.56.

Table N is a list of work done in public space for private parties, for their sole benefit and use, for which they pay the entire cost. Deposit to cover the estimated cost of the work is required in advance of the work being done. This work amounted to \$475.05.

H. N. MOSS, *Superintendent of Streets.*

The COMPUTING ENGINEER DISTRICT OF COLUMBIA.

Respectfully transmitted to the Engineer Commissioner District of Columbia, through Capt. H. C. Newcomer.

C. B. HUNT,

*Computing Engineer District of Columbia.*

TABLE A.—*Street railroads in operation in the District of Columbia, July 1, 1901.*

Name of company.	Tracks in use, owned by company.			
	Underground electric.		Overhead electric.	
	Double.	Single.	Double.	Single.
Washington Traction and Electric Co.:	<i>Miles.</i>	<i>Miles.</i>	<i>Miles.</i>	<i>Miles.</i>
Metropolitan Railroad.....	9.31	3.98	.....	.....
Columbia Railway.....	2.77	.....	4.12	.00
City and Suburban Rwy. of Washington.....	4.06	2.36	5.52	.....
Brightwood Rwy.....	.....	.....	5.98	.....
Georgetown and Tennallytown Rwy.....	.....	.....	4.16	.....
Anacostia and Potomac River R. R.....	6.55	.....	1.46	1.04
Washington and Great Falls Electric Rwy.....	.....	.....	3.08	.....
Washington and Glen Echo R. R.....	.....	.....	.10	.....
Capital Traction.....	13.44	3.26	3.57	.....
Baltimore and Washington Transit.....	.....	.....	.....	.43
Washington, Alexandria and Mount Vernon Electric Rwy.....	.90	.38	.....	.....
Total.....	37	9.98	28.80	2.90

TABLE B.—*Statement of character and extent of street pavements July 1, 1901.*

Section.	Asphalt and coal tar.	Asphalt block.	Vitrified block.	Granite.	Cobble.	Macadam.	Gravel and unimproved.	Total.
	<i>Sq. yds.</i>	<i>Sq. yds.</i>	<i>Sq. yds.</i>	<i>Sq. yds.</i>	<i>Sq. yds.</i>	<i>Sq. yds.</i>	<i>Sq. yds.</i>	<i>Sq. yds.</i>
Northwest.....	1,860,038	30,600	13,903	188,743	115,364	82,655	132,562	2,363,205
Northeast.....	225,461	148,908	0	19,111	1,736	61,510	487,732	944,660
Southeast.....	143,131	159,572	0	56,845	31,233	119,224	448,340	898,405
Southwest.....	153,218	30,504	2,943	233,973	74,723	43,284	156,962	665,607
Georgetown.....	138,065	12,819	0	60,363	25,187	14,837	39,653	290,954
Suburban.....	264,777	25,582	0	32,254	0	668,945	551,633	1,532,311
Total.....	2,774,720	407,995	16,846	571,289	248,385	980,465	1,816,902	6,816,532

TABLE C.—Statement showing mileage of street pavements July 1, 1901.

Section.	Asphalt and coal tar.		Asphalt block.		Vitrified block.		Granite.	
	Feet.	Miles.	Feet.	Miles.	Feet.	Miles.	Feet.	Miles.
Northwest .....	405,855	77.00	8,580	1.63	2,250	0.42	43,728	8.28
Northeast .....	59,651	11.30	30,543	5.78	0	0	4,700	.89
Southeast .....	37,441	7.09	38,128	7.22	0	0	15,406	2.92
Southwest .....	39,293	7.44	8,187	1.55	500	.10	55,716	10.55
Georgetown .....	38,517	7.39	3,786	.72	0	0	17,271	3.27
Suburban .....	66,398	12.39	7,733	1.46	0	0	9,376	1.78
Total .....	647,155	122.61	96,957	18.36	2,750	.52	146,197	27.69

Section.	Cobble.		Macadam.		Gravel and unimproved.		Total.	
	Feet.	Miles.	Feet.	Miles.	Feet.	Miles.	Feet.	Miles.
Northwest .....	21,309	4.00	17,625	3.33	41,280	7.82	540,627	102.43
Northeast .....	750	.14	13,674	2.59	127,508	24.15	236,324	44.85
Southeast .....	10,366	1.96	31,594	6.00	112,317	21.27	245,252	46.46
Southwest .....	16,224	3.09	10,370	1.96	44,414	8.41	174,774	33.16
Georgetown .....	9,631	1.82	4,420	.80	11,391	2.16	85,016	16.16
Suburban .....	0	0	164,736	31.20	180,000	30.30	408,243	77.13
Total .....	58,350	11.01	242,419	45.88	496,908	94.11	1,690,736	320.13

TABLE D.—*Descriptive list of street pavements and suburbs*

Street.	From—	To—	Kind of pavement or roadway.
A, NE	First	Second	Asphalt, H. B.
Do.	Second	Fourth	do
Do.	Fourth	Seventh	Coal tar
Do.	Seventh	Ninth	Asphalt block
A, SE	Second	Third	Asphalt, H. B.
Do.	Third	Sixth	Asphalt block
Do.	Sixth	Seventh	do
Do.	Seventh	North Carolina avenue	do
Acker	E and F, NE	Sixth and Seventh	do
Adams	Harrison	Jefferson	Gravel
Albemarle	Grant road	Thirty-eighth	Macadam
Do.	Thirty-eighth	Connecticut avenue	Gravel
Anacostia road	Pennsylvania avenue	District line	do
Arthur place	First, NW	New Jersey avenue	Asphalt block
Arthur street, Anacostia.	(Valley) Grant	High	Gravel
Avon	Cambridge	V	Asphalt, H. B.
B, NW	Delaware avenue	First	Asphalt block
Do.	First	Third	Granite
Do.	Sixth	Seventh	do
B, NW (north side)	Seventh	Ninth	Vitrified block
Do.	Ninth	Twelfth	do
B, NW	Seventh	Seventeenth	Cobble and rubble
Do.	Intersections	Fifteenth and Sixteenth	Asphalt, H. B.
B, NE	Delaware avenue	First	Coal tar
Do.	First	Second	do
Do.	Second	Fourth	Asphalt, H. B.
Do.	Fourth	Sixth	do
Do.	Sixth	Massachusetts avenue	Coal tar
Do.	Massachusetts avenue	Ninth	Asphalt, H. B.
Do.	Ninth	Eleventh	Gravel
Do.	Eleventh	Fourteenth	do
B, SE	New Jersey avenue	Second	Granite
Do.	do	do	Coal tar
Do.	First	do	Asphalt, H. B.
Do.	Second	Fifth	do
Do.	Fifth	North Carolina avenue	Coal tar
Do.	North Carolina avenue	Eleventh	Asphalt block
Do.	Eleventh	Nineteenth	Macadam
B, SW	First	New Jersey avenue	Granite
Do.	do	Maryland avenue	do
Do.	Sixth	Fourteenth	Asphalt, H. B.
Bacon, NW	Fourteenth	Fifteenth	Gravel
Baltimore	Columbia road	Nineteenth	Asphalt, H. B.
Do.	Nineteenth	Twentieth	Asphalt block
Bancroft	Connecticut avenue	Phelps place	Asphalt, H. B.
Bates road			Gravel
Belmont	Eighteenth	Columbia road	Asphalt, H. B.
Belt road			
Bennings road	Fifteenth	Eastward	Asphalt, H. B.
Do.	do	do	Granite
Do.		To bridge	Macadam
Do.	Eastern Branch	District line	Gravel
Binney	Fourteenth	Fifteenth	Macadam
Bladensburg road	Florida avenue		Asphalt, H. B.
Do.	do	District line	Macadam
Blair road	Umatilla	do	Gravel
Blagden's Mill road			do
Brentwood road	Florida avenue	Patterson	Macadam
Do.	do	District line	Gravel
Brightwood avenue	do	Pomeroy	Granite

## OPERATIONS OF THE ENGINEER DEPARTMENT, D. O.

*ays, with repairs to asphalt pavements to July 1, 1901.*

Square yards.	Price per square yard.	Original cost.	Resurfaced.		Repairs—average annual cost per square yard.			Remarks.
			Year.	Cost per square yard.	Prior to resurfacing.	Since resurfacing.	Current year.	
2,788	\$1.84	\$5,228.00			\$0.016	0	\$0.073	Relaid in 1900. In place of trap rock.
2,972	2.25	7,086.00			.08	0	.086	
4,906	1.98	10,610.00	1900	\$1.578	.088	0	0	
2,300	2.09	5,798.00						
1,724	2.09	8,714.00	1899	1.91	.046	0	0	
3,317	2.10	7,919.00						
2,391	1.984	5,995.00						
3,043	2.00	8,182.00						
1,708	1.77	4,607.00						
3,000								
2,666								Relaid in 1900. In place of trap rock.
8,700								
33,000								
1,398								
2,500								
1,590	2.00	4,009.00			.0006	0	0	
4,413	1.77	10,177.00						
3,256	1.77	5,763.00						
1,675								
2,374								
7,018		15,141.00						Widening.
22,875								
2,231	1.77	6,264.00						
4,411	3.20	14,114.00	1890	1.596	0	\$0.025	0	
3,098	3.20	9,913.00	1894	1.76	.08	0	0	
2,556	2.25	6,025.00			.088	0	.006	
2,016	2.25	5,496.00			.01		.06	
2,250	1.98	5,223.00			.087		0	
1,066	1.63	2,805.00		0	0	0	0	
1,950								
6,440								Laid by United States Government.
806	2.15	1,261.00						
6,487	3.20	20,758.00	1875	.965		.029		
2,065	2.18		1892	1.085	0	0	.01	
3,810	2.09	8,261.00		0	0	0	.12	
3,154	1.99	7,833.00	1899	1.98	.06	0	0	
4,578	2.00	15,475.00						
15,406	.75	19,883.00						
4,856								
5,305	.73	14,307.00						
12,840	1.47	19,883.00		0	.012		0	Permit work.
2,000								
2,075	1.78	5,410.00		0	0	0	0	
2,755	1.77	5,191.00						
1,913								
15,000								
1,584	1.76	3,557.00						
13,000								
5,414								
5,971								
6,000								Permit work.
22,000								
2,000								
6,078								
64,000								
6,000								
10,000								
6,400								
20,000								
738	2.78	2,639.00						

TABLE D.—*Descriptive list of street pavements and suburban roadways.*

Street.	From—	To—	Kind of pavement or roadway.
Brightwood avenue	Florida avenue	Grant	Granite
Do	Grant avenue	Irving	do
Do	Irving	Steuben	do
Do	do	do	do
Do	Steuben	Rock Creek Church road	Macadam
Do	Rock Creek Church road	District line	do
Branch avenue	Pennsylvania avenue extended.	Bowen road	Gravel
Broad Branch road	Howard	Laurel	do
Brown street			do
Bunker Hill road			do
C, NW	Delaware avenue	First	Granite
Do	New Jersey avenue	do	Asphalt, H. B.
Do	Second	Third	Granite
Do	Third	Four-and-a-half	Asphalt, H. B.
Do	Four-and-a-half	Seventh	do
Do	Seventh	Eighth	Granite
Do	Ninth	Tenth	Belgian
Do	Tenth	Eleventh	Cobble
Do	Twelfth	Fifteenth	do
Do	Eleventh	Twelfth	Asphalt, H. B.
C, NE	Delaware avenue	First	Granite
Do	First	Third	do
Do	Fourth	Sixth	Asphalt block
Do	Sixth	Eighth	do
Do	Eighth	Tenth	do
Do	Tenth	Tennessee avenue	Gravel
C, SE	New Jersey avenue	Fourth	Asphalt block
Do	Fourth	Sixth	do
Do	Sixth	Eleventh	Macadam
Do	Eleventh	Twelfth	Asphalt, H. B.
C, SW	New York avenue	First	do
Do	First	Four-and-a-half	Coal tar
Do	Four-and-a-half	Sixth	do
Do	Sixth	Seventh	Granite
Do	Ninth	Twelfth	Asphalt block
Do	Twelfth	Fourteenth	do
California	Florida avenue	Eighteenth	Asphalt, B. B.
Do	Eighteenth	Nineteenth	Asphalt, H. B.
Do	Columbia road	Phelps place	Macadam
Do	E and F, NE	First and Second	Asphalt, H. B.
Canal, east side	B, SW	C	Gravel
Canal, west side	do	do	Asphalt block
Canal	C, SW	E	Granite
Canal road	Thirty-seventh	Chain Bridge	Macadam
Cambridge	Q and U	Thirtieth and Avon	Asphalt, H. B.
Carroll	B and C, SE	First and Second	do
Carroll avenue, Takoma Park			Gravel
Caroline	T and V	Fifteenth and Sixteenth	Asphalt, B. B.
Cathedral avenue			Macadam
Cedar	S and T	Eighteenth and Nineteenth	Asphalt, H. B.
Central			Gravel
Chapel road			do
Chapin	Fourteenth	Alley west of Fourteenth	Asphalt block
Do	Alley	Westward	Granite
Do		Fifteenth	Asphalt, B. B.
Chain Bridge road			Gravel
Chestnut (Anacostia)	Maple	Arthur	do
Chestnut (Takoma Park)			do
Champlain avenue	Florida avenue	Columbia road	Macadam

with repairs to asphalt pavements to July 1, 1901—Continued.

Year laid.	Square yards.	Price per square yard.	Original cost.	Resurfaced.		Repairs—average annual cost per square yard.			Remarks.
				Year.	Cost per square yard.	Prior to resurfacing.	Since resurfacing.	Current year.	
1900	5,365	\$1.795							Permit work.
1886	1,297								
1892	2,221	2.00	\$5,732.00		0	0	0	0	
1873	2,683	3.20	8,586.00			\$0.035		0	
1901	3,262	1.794							
1900	2,448	1.77	4,660.00						
1900	12,500								
	3,775								
1873	36,246	3.20	115,988.00	1878	\$1.22				
				1884	.257		\$0.009		
				1887	.260		.008		
				1895	.297		.017		
				1897	.226		.001	\$0.01	
1894	140	1.68	185.00						Private expense.
1894	1,507	1.68							
1897	11,011	1.77	29,742.00						
1891	2,195	2.00	3,951.00		0	0	0	.014	
	1,000								
	72,000								Permit work.
	30,000								
1877	2,067	2.18	4,507.00	1896	1.46	.03	.052	.08	
1875	2,129	3.00	6,388.00			.012		0	
1888	4,551	2.00	17,452.00			.021		.015	
1890	1,163	2.25	4,842.00		0	0	0	0	4-inch base.
1901	961								
1894	1,617	3.44	5,559.00						
1875	3,818	3.00	11,455.00	1883	1.51	.071	.085	.002	
1889	328				0	.032	0	0	
1879	6,278		11,613.00						On asphalt block.
1895	936	1.38	1,289.00		0	0	0	0	
1899	1,374	1.76	4,679.00		0	0	0	0	
1873	1,509	1.50	2,263.00						
1873	2,105	.70	1,473.00						
1895	1,675		2,875.00						On cobble.
1891	2,788	2.25	10,282.00		0	0	0	0	
1901	2,902								
1892	4,117	2.90	11,595.00		0	0	0	0	
1899	3,922	1.76	8,282.00		0	0	0	0	
1897	1,641	1.63	4,257.00		0	0	0	0	4-inch base.
1901	5,028	1.794			0	0	0	0	
1892	3,274	2.00	7,595.00		0	0	0	0	
1889	4,394	2.00	11,282.00						
1890	3,860	2.00	9,979.00						
1897	1,798	1.77	3,638.00						
1900	323	1.77	744.00						
1896	2,064	1.84	4,467.00						
1895	6,831		4,046.00						
1889	4,329	2.00	12,456.00		0	0	0	0	
1891	2,905	2.25	10,721.00		0	0	0	0	4-inch base.
1887	2,363	1.99	7,068.00		0	.066		.064	
1875	4,079	1.50	6,119.00						
1873	6,736	.70	4,715.00						
	17,000								
1886	1,907								Permit work.
1879	2,056	1.92	3,951.00						
	4,500								
1890	2,394	.57	4,018.00						
1891	4,727	.91	10,189.00						
1895	3,660	.674	3,430.00						

TABLE D.—Descriptive list of street pavements and suburban roadways

Street.	From—	To—	Kind of pavement or roadway.
Cincinnati	Eighteenth	Rock Creek	Asphalt, H. B.
Cleveland place	W and Florida avenue	Twelfth and Thirteenth	Asphalt block
Clifton	Thirteenth	Fourteenth	Asphalt, B. B.
Columbia	O and Q	Ninth and Tenth	Coal tar
Do.	Sherman avenue	Thirteenth	Asphalt, H. B.
Do.	Thirteenth	Fourteenth	Asphalt block
Columbia road	Fourteenth	Eighteenth	Macadam
Concord road	Tenth NE	Thirteenth	do
Connecticut avenue	H.	Florida avenue	Coal tar
Do.	Intersection of Florida avenue		Asphalt, H. B.
Connecticut avenue (west side.)	Florida avenue	Leroy place	do
Connecticut avenue and Columbia road		Eighteenth	do
Connecticut avenue	California	Kalorama	Asphalt, B. B.
Do.	North of	Kalorama	do
Do.	Rock Creek	District line	Macadam
Conduit road			do
Corcoran	Q and R	Thirteenth and Fourteenth	Coal tar
Do.	do	Fourteenth and Fifteenth	do
Do.	do	Fifteenth and New Hampshire avenue	Asphalt, H. B.
Do.	do	New Hampshire avenue and Nineteenth	do
Crescent	Sixteenth	Westward	Macadam
D, NW	North Capitol	New Jersey avenue	Granite
Do.	New Jersey avenue	Fourth	Coal tar
Do.	Fifth	Sixth	Asphalt
Do.	Sixth to Eighth	Ninth to Tenth	Granite
Do.	Eighth	Ninth	Asphalt
Do.	Eleventh	Twelfth	Asphalt, H. B.
Do.	Twelfth	Fourteenth	Rubble
Do.	do	do	Cobble
Do.	Fourteenth	Fifteenth	Asphalt
Do.	Seventeenth	Eighteenth	Asphalt, H. B.
Do.	Eighteenth	Twentieth	Macadam
D, NE	Delaware avenue	Massachusetts avenue	Asphalt, B. B.
Do.	Massachusetts avenue	Maryland avenue	Asphalt, H. B.
Do.	Seventh	Ninth	do
Do.	Ninth	Thirteenth	do
D, SE	South Capitol	First	do
Do.	First	Third	Asphalt block
Do.	Third	Sixth	do
Do.	Sixth	Seventh	do
Do.	do	do	do
Do.	Seventh	Ninth	do
Do.	Ninth	Kentucky avenue	Gravel
D, SW	South Capitol	First	Asphalt, B. B.
Do.	First	Third	Asphalt, H. B.
Do.	Third	Four-and-a-half	Coal tar
Do.	Four-and-a-half	Seventh	Rubble
Do.	Seventh	Fourteenth	Cobble
Daniels road			Gravel
Defrees	H and I, NW	North Capitol and First	Asphalt block
Delaware avenue	B, N	C, N	Granite
Do.	C	E	Gravel
Do.	B, S	C, S	Macadam
Do.	O	G	do
Do.	G	K	do

Repairs to asphalt pavements to July 1, 1901—Continued.

Square yards.	Price per square yard.	Original cost.	Resurfaced.		Repairs—average annual cost per square yard.			Remarks.
			Year.	Cost per square yard.	Prior to resurfacing.	Since resurfacing.	Current year.	
6,000								
675								
1,309								
2,494	\$1.98	\$6,900.00		0	0	0	0	
4,932	1.47	7,307.00		0	\$0.039	0	0	
9,323	1.75	16,335.00	1891	\$1.38	.096	\$0.018	\$0.002	
2,487	2.00	5,386.00						
1,093		2,936.00						In place of asphalt block.
3,031	1.20	5,294.00		0	0	0	.013	Cobble base.
4,637	.70	3,247.00						
1,642	3.20	5,244.00	1878	1.44		.022	0	North side Rawlins square.
4,831	.55	2,657.00						
2,913		10,246.00						
5,640	2.00	16,004.00						
6,000								
5,003	1.84	13,966.00						
891	1.77	2,563.00						
7,492		11,987.00						
1,118	1.794	2,850.00		0	0	0	0	
3,840	2.00	9,839.00		0	0	0	0	
671	1.90	1,650.00		0	0	0	0	
2,363	1.63	4,704.00		0	0	0	0	
3,607	1.57	9,453.00		0	0	0	0	
3,000								
3,104	2.00	7,060.00		0	0	0	.0009	
1,580		3,768.00						In place of bitumen base.
2,371	1.97	5,785.00		0	.043		.034	
4,286	1.85	9,672.00		0	.0088		0	
6,867	2.25	19,367.00		0	0	0	0	
10,511	2.044	21,822.00	1889	1.37	.082	.012	.036	
6,989	2.25	16,462.00		0	.019		.054	
4,076	1.77	7,186.00		0	0	0	0	Macadam base.
3,738	1.76	7,676.00		0	0	0	0	
1,560	2.25	4,472.00		0	0	0	0	
1,949	2.00	4,534.00		0	0	0	0	
6,000								
1,666	2.00	3,860.00		0	0	0	0	
5,601					.054		.002	
2,062	1.98	8,743.00	1900		.054	.071	0	
4,382	1.47	6,454.00	1892	.675	.024		.005	
2,731	3.25	8,875.00			.022		.011	
2,359	1.78	4,199.00	1889	.93	.035	.031	0	
1,913	3.25	6,217.00	1891	1.61	.062	.02	0	
527	1.93	1,017.26						
4,257	2.69	11,151.00	1890	1.76	.05	.01	.0005	
2,103	1.74	3,660.00	{ 1882	1.07		.011		
			{ 1891	1.20		.04	0	
6,467	3.20	20,694.00	{ 1882	.753	.003			
2,856	1.85	5,372.00	{ 1891	.714	.033	.08	.001	
					.014		.02	
8,790	3.20	28,128.00	{ 1878	1.34		.008	0	
			{ 1897	1.73		.028	0	
			{ 1900	.96				
2,300	2.184	4,899.00		0	0	0	0	
2,964								
1,711		13,316.00						Hydraulic base.
8,339	2.00	19,797.00	1901		.044		0	
1,308	1.63	2,724.00		0	0	0	0	
8,057	1.57	19,587.00		0	0	0	0	

TABLE D.—*Descriptive list of street pavements and suburban roadways.*

Street.	From—	To—	Kind of pavement or roadway.
Delaware avenue.....	K.....	N.....	Gravel
Detroit.....	Twenty-fourth.....	B. and O. R. R.....	Macadam
Duncan place.....	D and E, NE.....	Twelfth and Thirteenth.....	Vitrified brick
E, NW.....	North Capitol.....	New Jersey avenue.....	Asphalt, H. B.
Do.....	New Jersey avenue.....	Fourth.....	do
Do.....	Fifth.....	Eleventh.....	do
Do.....	Eleventh.....	Thirteenth.....	Granite
Do.....	Thirteenth.....	Fourteenth.....	Asphalt, H. B.
Do.....	Pennsylvania avenue.....	Fifteenth.....	Asphalt
Do.....	Seventeenth.....	Nineteenth.....	Cobble
Do.....	Eighteenth.....	do.....	Coal tar
Do.....	Nineteenth.....	Virginia avenue.....	Cobble
E, NE.....	North Capitol.....	First.....	Granite
Do.....	First.....	Fourth.....	Asphalt block
Do.....	Fourth.....	Maryland avenue.....	Gravel
E, SE.....	South Capitol.....	Third.....	Asphalt block
Do.....	Third.....	Fourth.....	do
Do.....	Fourth to Ninth and Tenth to Eleventh.....	do.....	Macadam
Do.....	Ninth.....	Tenth.....	Asphalt, H. B.
Do.....	Eleventh.....	Thirteenth.....	do
Do.....	Intersection of Thirteenth.....	do.....	do
Do.....	Thirteenth eastward.....	do.....	do
Do.....	Extended to Fifteenth.....	do.....	do
Do.....	Fifteenth.....	Seventeenth.....	Gravel
E, SW.....	South Capitol.....	First.....	Asphalt, B. B.
Do.....	Virginia avenue.....	Third.....	Asphalt, H. B.
Do.....	Third.....	Four-and-a-half.....	Coal tar
Do.....	Four-and-a-half.....	Seventh.....	Asphalt, H. B.
Do.....	Seventh.....	Thirteenth.....	do
East Capitol.....	First.....	Ninth.....	do
Do.....	Fourth.....	Eleventh.....	do
East Capitol, north side.....	Eleventh.....	Thirteenth.....	Asphalt
East Capitol, south side.....	do.....	do.....	Asphalt, H. B.
Eckington place.....	A.....	R.....	do
Emerson place.....	E and F, NE.....	Thirteenth and Fourteenth.....	Asphalt, B. B.
Emporia.....	Twelfth.....	Brentwood road.....	Gravel
Euclid place.....	Fourteenth.....	University place.....	Asphalt, B. B.
Executive avenue, west of Treasury.....	North Capitol.....	New Jersey avenue.....	Asphalt, H. B.
F, NW.....	First.....	Fourth.....	Coal tar
Do.....	First.....	Fourth.....	Asphalt, H. B.
F, NW., south side.....	Fifth.....	Seventh.....	Coal tar
F, NW., north side.....	do.....	do.....	Asphalt, H. B.
F, NW.....	Seventh.....	Ninth.....	Asphalt, B. B.
F, NW. (north of railroad).....	do.....	do.....	Granite
F, NW.....	Ninth.....	Twelfth.....	Coal tar
Do.....	Twelfth.....	Thirteenth.....	do
Do.....	Thirteenth.....	Fifteenth.....	Asphalt, B. B.
Do.....	Seventeenth.....	Eighteenth.....	Asphalt, H. B.
Do.....	Eighteenth.....	Twenty-second.....	Coal tar
Do.....	Twenty-second.....	Twenty-third.....	Asphalt, H. B.
Do.....	Virginia avenue.....	Twenty-fifth.....	Vitrified block
Do.....	Twenty-fifth.....	New Hampshire avenue.....	Granite
F, NE.....	North Capitol.....	Third.....	Asphalt, B. B.
Do.....	Third.....	Eastward.....	Asphalt, H. B.
Do.....	Extension to Ninth.....	do.....	do

repairs to asphalt pavements to July 1, 1901—Continued.

	Square yards.	Price per square yard.	Original cost.	Resurfaced.		Repairs—average annual cost per square yard.			Remarks.
				Year.	Cost per square yard.	Prior to re-surfacing.	Since re-surfacing.	Current year.	
	6,000								
	675								
	1,369								
	2,494	\$1.98	\$6,900.00		0	0	0	0	
	4,932	1.47	7,307.00		0	\$0.030	0	0	
	9,323	1.75	16,335.00	1891	\$1.38	.006	\$0.018	\$0.002	
	2,487	2.00	5,386.00						
	1,063		2,936.00						
	3,031	1.20	5,294.00		0	0	0	.013	In place of asphalt block.
	4,637	.70	3,247.00						Cobble base.
	1,642	3.20	5,244.00	1878	1.44		.022	0	North side Rawlins square.
	4,831	.55	2,657.00						
	2,913		10,246.00						
	5,640	2.00	16,004.00						
	6,000								
	5,603	1.84	13,966.00						
	891	1.77	2,563.00						
	7,492		11,987.00						
	1,118	1.794	2,850.00		0	0	0	0	
	3,840	2.00	9,839.00		0	0	0	0	
	671	1.90	1,650.00		0	0	0	0	
	2,363	1.63	4,704.00		0	0	0	0	
	3,607	1.57	9,453.00		0	0	0	0	
	3,000								
	3,104	2.00	7,059.00		0	0	0	.0000	
	1,580		3,788.00						In place of bitumen base.
	2,371	1.97	5,785.00		0	.043		.034	
	4,286	1.85	9,672.00		0	.0088		0	
	6,867	2.25	19,367.00		0	0	0	0	
	10,511	2.044	21,822.00	1889	1.37	.082	.012	.036	
	6,989	2.25	16,462.00		0	.019		.054	
	4,076	1.77	7,186.00		0	0	0	0	Macadam base.
	3,738	1.76	7,676.00		0	0	0	0	
	1,560	2.25	4,472.00		0	0	0	0	
	1,949	2.00	4,534.00		0	0	0	0	
	6,000								
	1,666	2.00	3,860.00		0	0	0	0	
	5,601					.054		.002	
	2,962	1.98	8,743.00	1900		.054	.071	0	
	4,382	1.47	6,454.00	1892	.675	.024		.005	
	2,731	3.25	8,875.00			.022		.011	
	2,359	1.78	4,199.00	1889	.93	.035	.031	0	
	1,913	3.25	6,217.00	1891	1.61	.062	.02	0	
	527	1.93	1,017.26						
	4,257	2.69	11,151.00	1890	1.76	.05	.01	.0005	
	2,103	1.74	3,660.00	1882	1.07		.011		
				1891	1.20		.04	0	
	6,467	3.20	20,694.00	1882	.753	.003			
	2,856	1.85	5,372.00	1891	.714	.033	.08	.001	
						.014		.02	
	8,790	3.20	28,128.00	1878	1.34		.008	0	
				1897	1.73		.028	0	
				1900	.96				
	2,360	2.184	4,899.00		0	0	0	0	
	2,964								
	1,711		13,316.00						
	8,339	2.00	19,797.00	1901		.044		0	Hydraulic base.
	1,308	1.63	2,724.00		0	0	0	0	
	8,057	1.57	19,587.00		0	0	0	0	

TABLE D.—Descriptive list of street pavements and suburban roads

Street.	From—	To—	Kind of pavement or roadway.
F, NE	Ninth	Maryland avenue	Asphalt, H. B.
Do.	Thirteenth	Fourteenth	Macadam
F, SE	First	Second	Asphalt block
F, SW	do	Four-and-a-half	Granite
Do.	Four-and-a-half	Seventh	Asphalt, B. B.
Do.	Seventh	Tenth	Asphalt block
Fenton place	K and L	North Capitol and First	Gravel
Fillmore	Harrison	Jefferson	do
Flagler place	V	Albany	Asphalt block
Flint	Brightwood avenue	Fifth	Macadam
Florida avenue	North Capitol	First, W	Asphalt, H. B.
Do.	First	Fourth	Macadam
Do.	Fourth	New Jersey avenue	Asphalt, B. B.
Do.	New Jersey avenue	Seventh	do
Do.	Seventh	Ninth	Granite
Do.	Ninth	Sixteenth	Macadam
Do.	Sixteenth	Champlain avenue	do
Do.	Champlain avenue	Eighteenth	do
Florida avenue (n. side)	Eighteenth	Connecticut avenue	Asphalt, H. B.
Florida avenue (s. side)	do	do	do
Florida avenue	Intersection S and	Connecticut avenue.	do
Do.	R	S	Macadam
Do.	Q	R	Asphalt, H. B.
Florida avenue NE	North Capitol	New York avenue	do
Do.	New York avenue	Brentwood road	Macadam
Do.	Brentwood road	M	do
Do.	M	Ninth	do
Do.	Ninth	Fifteenth	do
Foxhall road			do
Frankfort	Twenty-second	Queen's Chapel road	do
Do.	Tennallytown road	Westward	Asphalt
Franklin			Gravel
French	R and S	Ninth and Tenth	Asphalt, B. B.
G, NW	North Capitol	New Jersey avenue	Coal tar
Do.	New Jersey avenue to F	Fourth and Fifth to Seventh	do
Do.	Fourth	Fifth	Asphalt, H. B.
Do.	Fifth	Seventh	do
Do.	Seventh	Ninth	Coal tar
Do.	Ninth	Fifteenth	do
Do.	Tenth	Fourteenth	Asphalt, H. B.
Do.	Ninth to Tenth and	Fourteenth to Fifteenth	do
Do.	Seventeenth	Twenty-second	Coal tar
Do.	Twenty-second	Twenty-seventh	Belgian
G, NE	North Capitol	First	Asphalt, B. B.
Do.	First	Second	Gravel
Do.	Second	Sixth	do
Do.	Sixth	Seventh	Macadam
Do.	Maryland avenue	Fourteenth	Asphalt, H. B.
G, SE	Third	Eleventh	Granite
Do.	Eleventh	Pennsylvania avenue	Asphalt block
Do.	Thirteenth	Seventeenth	Macadam
G, SW	South Capitol	Third	Granite
Do.	Third	Four-and-a-half	Asphalt, H. B.
Do.	Four-and-a-half	Eighth	Coal tar
Do.	Eighth	Water	do
Good Hope road			Macadam
Grace	Thirty-second	Thirty-third	Cobble
Grant avenue	Brightwood avenue	Florida avenue	Macadam
Grant	Sixteenth	Eighteenth	do
Grant place	G and H, NW	Ninth and Tenth	Asphalt, H. B.

Repairs to asphalt pavements to July 1, 1901—Continued.

Square yards.	Price per square yard.	Original cost.	Resurfaced.		Repairs—average annual cost per square yard.			Remarks.
			Year.	Cost per square yard.	Prior to resurfacing.	Since resurfacing.	Current year.	
3,024	\$1.80	\$5,677.00	-----	0	0	0	0	Permit.
3,000	-----	-----	-----	-----	-----	-----	-----	
2,466	1.77	4,072.00	-----	-----	-----	-----	-----	
6,779	2.42	20,496.00	-----	-----	-----	-----	-----	
4,315	3.20	13,808.00	1880	\$1.11	-----	\$0.019	\$0.048	
3,973	1.77	8,689.00	-----	-----	-----	-----	-----	
2,000	-----	-----	-----	-----	-----	-----	-----	
4,700	-----	-----	-----	-----	-----	-----	-----	
3,270	1.77	7,619.00	-----	-----	-----	-----	-----	
8,416	-----	-----	-----	-----	-----	-----	-----	
5,840	1.63	13,403.00	-----	0	0	0	0	4-inch base.
5,080	.99	8,826.00	-----	-----	-----	-----	-----	
1,154	2.00	9,042.00	-----	0	0	0	0	
12,208	2.60	18,132.00	-----	-----	\$0.022	-----	.0523	
12,304	3.50	8,063.00	-----	-----	-----	-----	-----	
12,436	1.50	-----	-----	-----	-----	-----	-----	
12,032	1.50	9,048.00	-----	-----	-----	-----	-----	
12,500	-----	-----	-----	-----	-----	-----	-----	
12,435	1.94	4,911.00	-----	0	0	0	0	
12,645	1.63	5,305.00	-----	0	0	0	0	
12,906	1.94	4,713.00	-----	0	0	0	0	In place of coal tar. Widening.
12,000	-----	-----	-----	-----	-----	-----	-----	
12,402	1.94	6,767.00	-----	0	0	0	0	
12,428	1.76	15,184.00	-----	0	0	0	0	
12,042	.57	2,288.00	-----	-----	-----	-----	-----	
12,793	.86	9,793.00	-----	-----	-----	-----	-----	
12,314	.77	6,788.00	-----	-----	-----	-----	-----	
12,109	.99	24,790.00	-----	-----	-----	-----	-----	
12,000	-----	-----	-----	-----	-----	-----	-----	
12,300	-----	-----	-----	-----	-----	-----	-----	
5,000	-----	-----	-----	0	0	0	0	Do.
12,000	-----	-----	-----	-----	-----	-----	-----	
12,662	2.00	4,218.00	-----	0	.004	-----	0	
12,802	1.98	10,809.00	-----	0	.034	-----	.06	
12,179	3.20	29,373.00	1879	.75	-----	.042	-----	
12,304	2.18	3,893.00	-----	-----	-----	-----	-----	
12,281	-----	-----	-----	-----	-----	-----	-----	
12,514	3.20	8,045.00	1884	1.56	.014	.047	.0015	
12,583	3.20	40,267.00	1878	.60	.017	-----	-----	
12,583	3.20	40,267.00	1880	.315	-----	-----	-----	
12,583	3.20	40,267.00	1889	-----	-----	-----	-----	
1,565	2.19	3,715.00	-----	-----	-----	-----	-----	Do.
1,147	-----	-----	-----	-----	-----	-----	-----	
10,275	3.30	32,882.00	1878	1.40	.026	-----	-----	
10,275	3.30	32,882.00	1882	-----	.039	-----	-----	
10,275	3.30	32,882.00	1892	-----	.014	-----	.004	
10,275	3.30	32,882.00	1899	-----	-----	-----	-----	
9,511	3.50	33,288.00	-----	-----	-----	-----	-----	
2,308	2.00	7,420.00	-----	-----	.017	-----	.004	
3,077	-----	-----	-----	-----	-----	-----	-----	
6,234	.23	2,966.00	-----	-----	-----	-----	-----	In place of coal tar.
1,768	.96	3,212.00	-----	-----	-----	-----	-----	
552	1.63	-----	-----	0	0	0	0	
5,300	-----	-----	-----	-----	-----	-----	-----	
1,730	2.00	8,085.00	-----	-----	-----	-----	-----	
3,737	1.05	11,399.00	-----	-----	-----	-----	-----	
6,517	-----	18,690.00	-----	-----	-----	-----	-----	
2,476	-----	5,545.00	-----	0	0	0	0	
5,933	3.20	18,886.00	-----	-----	-----	-----	-----	
5,050	3.00	16,149.00	1881	1.46	-----	.02	0	
10,000	-----	-----	-----	-----	-----	-----	-----	Neuchatel.
1,400	-----	-----	-----	-----	-----	-----	-----	
4,000	-----	-----	-----	-----	-----	-----	-----	
3,000	-----	-----	-----	-----	-----	-----	-----	
1,435	4.25	6,097.00	-----	-----	.036	-----	.057	

TABLE D.—Descriptive list of street pavements and suburban roadways

Street.	From—	To—	Kind of pavement or roadway.
Grant road			Gravel
Grant (Pleasant).	Nichols avenue	Pillmore	do
H, NW	North Capitol	First	Asphalt, H. B.
Do.	First	Fourth	Granite
Do.	Fourth	Seventh	Coal tar
Do.	Seventh	Thirteenth	do
Do.	Thirteenth	Fourteenth	do
Do.	Fourteenth	Fifteenth	Asphalt, H. B.
Do.	Fifteenth	Vermont avenue	do
Do.	Vermont avenue	Connecticut avenue	Asphalt
Do.	Connecticut avenue	Pennsylvania avenue	Asphalt, H. B.
Do.	Pennsylvania avenue	Twenty-second	Coal tar
Do.	Twenty-second	Twenty-third	Asphalt, H. B.
Do.	Twenty-third	Twenty-fifth	Cobble
H, NE	North Capitol	First	Asphalt, H. B.
H, NE. (north side)	First	Fifteenth	do
H, NE. (south side)	do	do	Asphalt, B. B.
H, SW	One-half	First	Macadam
H, SE	First	Second	Gravel
H, SW	do	Third	Asphalt, B. B.
Do.	Third	Four-and-a-half	Asphalt, H. B.
Do.	Four-and-a-half	Seventh	do
Do.	Seventh	Ninth	do
Do.	Ninth	Water	Granite
Harewood road			Gravel
Harrison	Navy-yard bridge eastward.		Vitrified block
Do.	Extended to Minnesota avenue.		Asphalt, H. B.
Do.			do
Hartford	Tenth	Thirteenth	Gravel
Harvard	Brightwood avenue	do	do
Do.	Thirteenth	Fourteenth	Asphalt block
High	Maple	Arthur	Gravel
Heckman, SE	First and Second	E and F	Asphalt block
Hillyer	Q and R	Twentieth and Twenty-first	do
Holmead	Whitney avenue	Spring road	Gravel
Hopkins	O and P	Twentieth and Twenty-first	Asphalt
Howard	Brightwood avenue	Sixth	Macadam
Do.	Fourteenth	Seventeenth	do
Do.	Eighteenth	500 feet west	do
I, NW	North Capitol	New Jersey avenue	Coal tar
Do.	Second	Fifth	Asphalt, H. B.
Do.	Fifth	Eighth	do
Do.	Eighth	Ninth	do
Do.	Ninth	Tenth	do
Do.	Tenth	Eleventh	do
Do.	Eleventh	Thirteenth	Coal tar
Do.	Thirteenth	Fifteenth	Asphalt, H. B.
Do.	Fifteenth	Seventeenth	Coal tar
Do.	Seventeenth	Eighteenth	Asphalt, H. B.
Do.	Eighteenth	Pennsylvania avenue	do
Do.	Pennsylvania avenue	Twenty-third	Asphalt
Do.	Twenty-third	New Hampshire avenue	Asphalt, H. B.
Do.	New Hampshire avenue	Twenty-sixth	do
I, NE	North Capitol	First	Asphalt, B. B.
Do.	Sixth	Seventh	Macadam
Do.	Seventh	Florida avenue	Gravel
I, SE	South Capitol	New Jersey Avenue	Granite
Do.	Second	Third	Macadam
Do.	Third	Eighth	do
Do.	Fourth	Eleventh	Asphalt, H. B.

Repairs to asphalt pavements to July 1, 1901—Continued.

Square yards.	Price per square yard.	Original cost.	Resurfaced.		Repairs—average annual cost per square yard.			Remarks.
			Year.	Cost per square yard.	Prior to resurfacing.	Since resurfacing.	Current year.	
13,700								In place of granite.
1,250								
3,465	\$2.19	\$9,026.00		0	0	0	0	
4,872	1.87	9,403.00						
6,381	1.97	19,044.00	1900	\$1.65	\$0.046		0	
9,067	3.20	29,014.00	{ 1880	.473	.012			In place of coal tar. On asphalt block.
2,144	3.30	6,861.00	{ 1889	.635		\$0.051	\$0.013	
1,735	2.25	5,982.00	{ 1886	1.81	.022	.04	.057	
2,422	2.18	6,365.00		0	0	0	0	
2,604	1.05	2,736.00			.019		.014	
5,451	2.25	18,608.00	1901	.817	.051		.021	
6,493	3.20	20,778.00	1880	1.262	.014	.019	.003	
1,442	1.54	4,104.00		0	0	0	0	
2,708	.70	1,896.00						
4,190	2.20	9,697.00	1891	1.07	.013	.088	.06	
4,124	2.30	31,551.00	{ 1891					
			{ 1892	1.21	.059	.039	.01	
			{ 1893					
2,591	2.00	32,500.00			.019		.023	
1,611		1,984.00						
1,848		1,281.00						
4,111	2.00	12,255.00			.019		.108	
2,407	1.99			0	0	0	0	
4,327	1.85	10,128.00			.017		.003	
2,138	2.23	6,126.00			.033		.116	
1,581	.67	5,105.00						
12,000		12,000.00						
1,099								
2,793	1.76	9,462.00		0	0	0	0	
2,091	1.80	4,579.00		0	0	0	0	
3,700								
6,113								
2,377	1.77	4,637.00						
2,000								
1,791	1.77	3,963.00						Permit work.
1,552								
6,500								
749	2.00	3,084.00		0	0	0	0	
952	.90	1,175.00						
7,200								
1,560								
4,577	3.00	13,671.00	1889	1.03	.032	.003	0	
5,804	2.25	17,694.00			.049		.065	
4,210	1.47	6,352.00			.027			
755	2.25	2,413.00			.001		.013	
2,090	1.47	4,970.00			.01		.01	
714	2.25	2,285.00			.014		.015	
3,700	3.20	11,839.00	1878	.995	.015		.008	
4,632			{ 1895	1.96	.03	0	0	
8,222	3.20	26,630.00	{ 1878	.883		.022	0	Macadam base.
2,672	1.85	7,431.00	{ 1894	1.59	.014		.002	
5,327	2.25	13,331.00			.02		.059	
6,644	1.20	17,192.00		0	0	0	0	
2,249	1.63	5,125.00		0	0	0	0	
3,136	1.54	7,034.00		0	0	0	0	
3,294	2.00	8,809.00		0	0	0	.003	
2,200								
7,000								
3,867		4,038.00						
1,292	.95	2,204.00						
4,249	.93	6,796.00						
3,214	1.63	9,352.00		0	0	0	0	

TABLE D.—*Descriptive list of street pavements and suburban roadways.*

Street.	From—	To—	Kind of pavement or roadway.
I, SE .....	Eleventh .....	Thirteenth .....	Gravel .....
I, SW .....	Canal .....	First .....	Macadam .....
Do .....	First .....	Third .....	Gravel .....
Do .....	Third .....	Sixth .....	Asphalt block .....
Do .....	Sixth .....	Water .....	Gravel .....
Illinois avenue .....	Rock Creek Church road .....	Grant circle .....	do .....
Irving place .....	Thirtieth .....	Avon .....	Asphalt, H. B. .....
Irving .....	Brightwood avenue .....	Thirteenth .....	Gravel .....
Indiana avenue .....	First .....	Third .....	Asphalt .....
Indiana and Louisiana avenues .....	Third .....	Seventh .....	Granite .....
Do .....	do .....	do .....	Asphalt, H. B. .....
Do .....	do .....	do .....	Vitrified block .....
Jackson .....	G and H .....	First E and First W .....	Cobble .....
Do .....	Nichols avenue .....	Taylor .....	Gravel .....
James .....	G and H, NE .....	Twelfth and Thirteenth NE .....	Macadam .....
Jefferson .....	K (Georgetown) .....	M .....	Cobble .....
Do .....	Nichols avenue .....	Taylor .....	Gravel .....
Jefferson place .....	M and N, NW .....	Eighteenth and Nineteenth .....	Asphalt block .....
Johnson .....	R and S .....	Fourteenth and Fifteenth .....	Asphalt, B. B. .....
Joliet .....	Connecticut avenue .....	Zoo entrance .....	Macadam .....
K, NW .....	North Capitol .....	First .....	Asphalt, H. B. .....
Do .....	First .....	Third .....	Asphalt .....
Do .....	Third .....	Seventh .....	Coal tar .....
Do .....	North side Mount Vernon square.		do .....
Do .....	South side Mount Vernon square.		Asphalt, H. B. .....
Do .....	Ninth .....	Eighteenth .....	Coal tar .....
Do .....	Eighteenth .....	Twenty-third .....	Asphalt, H. B. .....
Do .....	Twenty-third .....	Rock Creek .....	Trap rock .....
Do .....	Rock Creek .....	Aqueduct Bridge .....	Seneca stone .....
Do .....	Rock Creek .....	Aqueduct Bridge .....	Granite .....
K, NE .....	North Capitol .....	First .....	Asphalt, B. B. .....
Do .....	First .....	Seventh .....	Gravel .....
Do .....	Eleventh .....	Twelfth .....	Macadam .....
K, SE .....	South Capitol .....	Second .....	do .....
Do .....	Second .....	Sixth .....	Gravel .....
Do .....	Virginia avenue .....	Fourteenth .....	do .....
K, SW .....	South Capitol .....	First .....	Granite .....
Do .....	First .....	Water .....	Macadam .....
Kalorama .....	Eighteenth .....	Columbia road .....	Asphalt block .....
Do .....	Nineteenth .....	Westward .....	Asphalt .....
Kansas avenue .....	Brightwood avenue .....	Trenton .....	Gravel .....
Kenesaw .....	Brightwood avenue to Thirteenth and Fourteenth to Sixteenth.		do .....
Do .....	Thirteenth .....	Fourteenth .....	Asphalt block .....
Kenesaw and Park road .....	Thirteenth .....	do .....	Macadam .....
Kentucky avenue .....	South Capitol .....	B .....	Gravel .....
Kenyon .....	Thirteenth .....	Fourteenth .....	Asphalt, H. B. .....
Kingman place .....	P and Q, Thirteenth and Fourteenth.		Asphalt .....
Kling road .....	Linnean Hill road to Rock Creek.		Macadam .....
Do .....	Rock Creek .....	Woodley road .....	Gravel .....
L, NW .....	North Capitol .....	New Jersey avenue .....	Asphalt, B. B. .....
Do .....	Fourth .....	Fifth .....	Granite .....
Do .....	New Jersey avenue .....	Fourth .....	Coal tar .....
Do .....	Fifth .....	Sixth .....	
Do .....	Eighth .....	Seventeenth .....	
Do .....	Connecticut avenue .....	Twentieth .....	
Do .....	Sixth .....	Eighth .....	Asphalt, H. B. .....

repairs to asphalt pavements to July 1, 1901—Continued.

	Square yards.	Price per square yard.	Original cost.	Resurfaced.		Repairs—average annual cost per square yard.			Remarks.
				Year.	Cost per square yard.	Prior to resurfacing.	Since resurfacing.	Current year.	
	3,100								
	1,424								
	3,530								
	4,850	\$1.77	\$10,493.00						
	2,600								
	8,400								
	1,251	2.00	2,725.00		0	0	0	0	
	6,493								
	8,329	2.00	23,824.00		0	\$0.007		\$0.013	4-inch base.
	9,038	2.00	33,149.00						
	4,054	1.85	6,880.00		0	.015		.016	
	205								
	3,800								
	7,300								
	1,400								
	2,839	.70	1,987.00						
	7,500								
	1,303								Permit work.
	1,446		3,887.00		0	0	0	0	
	850								
	4,537	1.76	9,859.00		0	0	0	0	
	3,984		7,130.00		0	0	0	0	Rubble base.
	8,384	3.20	26,829.00	1878	\$1.65		\$0.015		
				1889	.487				
	1,800	3.20		1894	.90		.034	.012	
	2,000								
	27,551	3.00	82,654.00	1889	.06	.007			
				1892	.74		.025	.002	
				1895	.557				
				1898	.19				
	11,671	1.83	21,358.00			.014		.027	
	7,521	3.50	38,813.00						
	4,996	2.50							
	18,021		63,075.00						
	4,498	2.00	13,513.00		0	0	0	0	
	15,000								
	1,475								
	6,000								
	3,500								
	2,700								
	1,706		5,654.00						
	7,961	.57	11,923.00						
	2,313	1.77	4,501.00						
	4,600				0	0	0	0	
	3,500								
	10,409								
	2,548	1.77	5,125.00						
	11,185								
	3,750								
	2,964	1.76	5,354.00		0	0	0	0	
	1,699		4,579.00			.003		.006	
	4,877								
	7,000								
	5,288		13,907.00			.002		.001	
	2,665	1.78	4,744.00						
						.002			
				1887			.005		
				1889			.02		
				1891			.045	.017	
				1897				.065	
	23,890	2.18	51,115.00						
	2,645	2.27	6,017.00			.038			

TABLE D.—*Descriptive list of street pavements and suburban roadways.*

Street.	From—	To—	Kind of pavement or roadway.
L, NW	Seventeenth	Connecticut avenue	Coal tar
Do	Twentieth	Twenty-fifth	Asphalt, H. B.
Do	Pennsylvania avenue	Twenty-sixth	do
Do	Twenty-sixth	Twenty-seventh	Asphalt, B. B.
L, NE	N. Capitol	Eighth	Macadam
L, SE	S. Capitol	Second	do
Do	Second	Fourth	Gravel
Do	Fourth	Eighth	do
L, SW	S. Capitol	Four-and-a-half	do
Do	Four-and-a-half	Water	Macadam
Lansing	Tenth	Thirteenth	Gravel
Lamar			do
Leroy place	Connecticut avenue	Phelps place	Asphalt, H. B.
Linnean Mill road		Gravel	
Lincoln avenue		do	
Loughboro road		do	
Louisiana avenue	Intersection	C and seventh.	Asphalt, H. B.
Do	Intersection	C and Seventh.	Vitrified block
Do	Front of	Opera House.	Granite
Do	Eighth	Ninth	do
Do	Ninth	Tenth	do
Lowell	Sixteenth	Eighteenth	Macadam
Lydecker	Whitney avenue	Fourteenth	Gravel
M, NW	N. Capitol	First	Asphalt, H. B.
Do	First	New Jersey avenue	Asphalt, B. B.
Do	New Jersey avenue	Sixth	Asphalt, H. B.
Do	Sixth	Fourteenth	do
Do	Fourteenth	Sixteenth	do
Do	Sixteenth	Eighteenth	Coal tar
Do	Eighteenth	New Hampshire avenue	Asphalt, H. B.
Do	Twenty-first	Twenty-sixth	do
Do	Twenty-sixth	Rock Creek	do
Do	Rock Creek	Twenty-eighth	Coal tar
Do	Twenty-eighth	Thirty-first	do
M, NW (S. side)	Thirty-first	Thirty-second	Asphalt, H. B.
M, NW (N. side)	do	do	do
M, NW	Thirty-second	Thirty-third	do
Do	Thirty-third	Thirty-sixth	do
M, NE	North Capitol	Second	do
Do	Second	Florida avenue	do
Do	Twelfth	Trinidad avenue	Macadam
M, SE	South Capitol	New Jersey avenue	Cobble
Do	New Jersey avenue	Fourth	Rubble
Do	Fourth	Ninth	Cobble
M, SW	South Capitol	Four-and-a-half	Rubble
Do	Four-and-a-half	Sixth	Granite
Do	do	Water	do
Madison	P and Q	Fifteenth and Seventeenth	Coal tar
Do	do	Seventeenth and Eighteenth	Asphalt, B. B.
Do	M and N	Sixth and Seventh	do
McLean avenue	N and O	Third and Four-and-a-half	Asphalt block
Magnolia	Chestnut	Oak	Gravel
Maple (Takoma)	B & O. R. R.	District line	do
Maple (Le Droit Park)	Florida avenue	Second	Asphalt, B. B.
Do	Second	Fourth	Asphalt, H. B.
Maple (Anacostia)	Pleasant	High	Gravel
Maine avenue	Third	Sixth	Cobble
Marion	P and Q	Sixth and Seventh	Asphalt, B. B.
Maryland avenue N.E.	First	Fourth	Asphalt block
Do	Sixth	Eleventh	do

repairs to asphalt pavements to July 1, 1901—Continued.

	Square yards.	Price per square yard.	Original cost.	Resurfaced.		Repairs—average annual cost per square yard.			Remarks.
				Year.	Cost per square yard.	Prior to resurfacing.	Since resurfacing.	Current year.	
	1,628	\$1.20	\$5,210.00	{ 1878	\$1.96	-----	\$0.015	-----	
	8,141	2.26	18,662.00	{ 1888	.58	-----	.035	-----	
	483	3.25	1,689.00	-----	-----	\$0.043	-----	-----	
	1,179	2.00	2,358.00	-----	0	0	0	0	
	1,500	-----	-----	-----	-----	-----	-----	-----	
	6,000	-----	-----	-----	-----	-----	-----	-----	
	2,300	-----	-----	-----	-----	-----	-----	-----	
	6,030	-----	2,700.00	-----	-----	-----	-----	-----	
	7,000	-----	-----	-----	-----	-----	-----	-----	
	4,332	-----	4,681.01	-----	-----	-----	-----	-----	
	3,625	-----	-----	-----	-----	-----	-----	-----	
	3,400	-----	-----	-----	-----	-----	-----	-----	
	1,706	1.93	3,817.00	-----	0	0	0	0	
	8,000	-----	-----	-----	-----	-----	-----	-----	
	30,000	-----	-----	-----	-----	-----	-----	-----	
	10,600	-----	-----	-----	-----	-----	-----	-----	
	2,702	-----	-----	-----	0	0	0	0	
	384	-----	-----	-----	-----	-----	-----	-----	
	784	3.25	2,548.00	-----	-----	-----	-----	-----	
	1,137	1.91	2,274.00	-----	-----	-----	-----	-----	
	4,765	3.25	15,488.00	-----	-----	-----	-----	-----	
	1,850	-----	-----	-----	-----	-----	-----	-----	
	3,600	-----	-----	-----	-----	-----	-----	-----	
	3,067	2.184	7,285.00	-----	0	0	0	0	
	2,597	2.00	6,711.00	-----	-----	.0013	-----	0	
	5,564	1.85	15,158.00	-----	-----	.012	-----	.016	
	13,147	1.75	32,109.00	{ 1895	.38	-----	.035	-----	
	4,573	2.08	9,788.00	{ 1900	-----	.04	-----	.03	
	5,851	3.20	18,723.00	-----	0	.02	-----	.06	
	6,084	1.47	9,143.00	{ 1878	1.49	-----	-----	-----	
	9,171	2.26	2,188.00	{ 1895	-----	.025	.012	.002	
	500	-----	-----	-----	-----	.03	-----	.066	
	1,138	2.67	3,039.00	-----	-----	.02	-----	.041	
	7,887	3.70	31,966.00	{ 1895	2.36	-----	-----	0	
	762	1.63	1,926.00	{ 1897	1.36	-----	.04	-----	
	778	1.55	1,803.00	-----	-----	.15	-----	.063	
	3,581	1.574	8,736.00	1888	.693	-----	.033	.044	
	4,476	1.63	10,824.00	-----	0	0	0	0	
	5,486	2.10	15,445.00	-----	0	0	0	0	
	7,183	1.63	16,788.00	-----	0	0	0	0	
	3,449	.494	2,696.00	-----	-----	-----	-----	-----	
	5,724	.70	4,007.00	-----	-----	-----	-----	-----	
	6,973	1.50	10,460.00	-----	-----	-----	-----	-----	
	8,454	-----	-----	-----	-----	-----	-----	-----	
	9,177	1.05	9,636.00	-----	-----	-----	-----	-----	
	1,125	-----	4,120.00	-----	-----	-----	-----	-----	
	757	-----	2,763.00	-----	-----	-----	-----	-----	
	2,674	3.00	8,022.00	-----	-----	.032	-----	0	
	2,271	2.00	7,122.00	-----	-----	.012	-----	.002	
	1,538	2.00	4,619.00	-----	-----	.009	-----	0	
	2,127	-----	-----	-----	-----	-----	-----	-----	
	4,000	-----	-----	-----	-----	-----	-----	-----	
	2,500	-----	-----	-----	-----	-----	-----	-----	
	2,237	2.00	-----	-----	0	0	0	0	
	3,680	2.25	11,486.00	-----	-----	.001	-----	0	
	3,000	-----	-----	-----	-----	-----	-----	-----	
	4,634	.70	3,244.00	-----	-----	-----	-----	-----	
	2,861	2.00	7,766.00	-----	-----	.002	-----	.004	
	11,535	2.00	29,945.00	-----	-----	-----	-----	-----	
	14,951	2.00	39,634.00	-----	-----	-----	-----	-----	

TABLE D.—*Descriptive list of street pavements and suburban roadways.*

Street.	From—	To—	Kind of pavement or roadway.
Maryland avenue NE.	Eleventh	Thirteenth	Asphalt block
Do.	Thirteenth	Fifteenth	do
Do.	Intersection	Fifteenth.	Asphalt, H. B.
Maryland avenue SW.	First	Third	do
Do.	Third	Seventh	Cobble.
Do.	do	do	Rubble
Do.	Seventh	Fourteenth	Belgian
Massachusetts avenue NW.	North Capitol	New Jersey avenue.	Coal tar
Do.	New Jersey avenue.	Third	Asphalt, H. B.
Massachusetts avenue NW. (south side).	Fourth.	Seventh	do
Massachusetts avenue NW. (north side).	do	do	do
Massachusetts avenue NW.	Intersection Fourth.		do
Do.	Intersection Fifth.		do
Do.	Ninth	Thirteenth	do
Do.	Thirteenth	Fourteenth	Asphalt, B. B.
Do.	Fourteenth	Twentieth.	Coal tar
Do.	Highland Terrace, Fourteenth to Fifteenth.		do
Triangular reservation north of Twentieth street.			do
Massachusetts avenue NW.	Twentieth	Florida avenue	do
Do.	Florida avenue	Sheridan circle	Asphalt, H. B.
Sheridan circle.			do
Massachusetts avenue NW.	Circle	Belmont	Macadam
Massachusetts avenue NE.	North Capitol	First	Asphalt, H. B.
Do.	First	Second	Asphalt block
Do.	Second	Fourth.	Asphalt, H. B.
Do.	do	do	do
Do.	Sixth	Eighth	Asphalt block
Do.	Eighth	Eleventh	do
Michigan avenue.	North Capitol	Lincoln avenue	Macadam
Military road.			do
Do.			Gravel
Milwaukee			do
Minnesota avenue	Harrison	Pennsylvania avenue	do
Missouri avenue	Third	Four-and-a-half	Granite
Do.	Four-and-a-half	Sixth	Asphalt block
Morgan	M and N.	New Jersey avenue and Kirby.	Asphalt, H. B.
Do.	Lydecker	Spring road.	Gravel
Morris place	F and G, NE.	Sixth and Seventh	Asphalt block
Murdock Mill road.			Gravel
Myrtle	I and K	North Capitol and First	Asphalt, B. B.
Mount Olivet road			Gravel
N, NW	North Capitol	Third	Asphalt, H. B.
Do.	New Jersey avenue.	Fifth	Asphalt, B. B.
Do.	Fifth.	Ninth	Asphalt, H. B.
Do.	Ninth	Fourteenth.	do
Do.	Fourteenth	Scott square.	do
Do.	Scott square.	New Hampshire avenue.	Coal tar
Do.	New Hampshire ave- nue.	Twenty-first.	do
Do.	Twenty-first.	Twenty-second	Asphalt
Do.	Twenty-second	Twenty-fourth	Asphalt, H. B.

with repairs to asphalt pavements to July 1, 1901—Continued.

Year laid.	Square yards.	Price per square yard.	Original cost.	Resurfaced.		Repairs—average annual cost per square yard.			Remarks.
				Year.	Cost per square yard.	Prior to resurfacing.	Since resurfacing.	Current year.	
1890	8,269	\$2.00	\$22,966.00	-----	-----	-----	-----	-----	
1891	9,635	2.00	24,840.00	-----	-----	-----	-----	-----	
1901	2,360	-----	-----	-----	0	0	0	0	
1883	3,394	2.29	7,800.00	-----	-----	\$0.02	-----	\$0.005	
1873	8,750	.70	6,125.00	-----	-----	-----	-----	-----	
1873	4,050	1.75	7,113.00	-----	-----	-----	-----	-----	
1875	26,299	3.50	95,046.00	-----	-----	-----	-----	-----	
1887	5,143	1.98	14,179.00	-----	-----	.046	-----	.093	
1882	3,858	2.26	8,834.00	1891	\$1.43	.035	\$0.044	.005	
1881	3,910	1.83	7,349.00	1889	.309	.063	.088	0	
1883	3,108	2.29	7,112.00	-----	-----	.057	-----	.071	
1877	742	1.95	1,447.00	-----	-----	.024	0	0	
1877	498	1.95	971.00	1899	-----	.057	0	0	
1880	9,920	1.47	14,749.00	-----	-----	.012	-----	.009	
1877	2,991	2.18	6,520.00	1884	1.43	.015	0.56	.006	
1873	13,898	3.20	44,474.00	1892	.17	.015	.043	-----	
1873	1,248	3.20	3,995.00	1895	.68	-----	.135	.007	
1873	2,646	3.20	8,468.00	-----	-----	.005	-----	.016	
-----	-----	-----	-----	-----	-----	.025	-----	0	
1875	5,817	3.00	17,453.00	-----	-----	.019	-----	.104	
1897	2,572	1.57	4,994.00	-----	0	0	0	0	
1900	5,156	1.78	12,023.00	-----	0	0	0	0	
1890	12,250	-----	-----	-----	0	0	0	0	
1891	4,069	2.25	12,102.00	-----	-----	.008	-----	0	
1893	3,961	2.00	11,684.00	-----	-----	-----	-----	-----	
1895	5,223	1.68	11,121.00	-----	0	0	0	0	
1896	419	2.19	1,025.00	-----	0	0	0	0	
1889	6,749	2.00	16,444.00	-----	-----	-----	-----	-----	
1895	6,398	1.84	13,677.00	-----	-----	-----	-----	-----	
1901	12,816	-----	-----	-----	-----	-----	-----	-----	
-----	6,400	-----	-----	-----	-----	-----	-----	-----	
-----	10,000	-----	-----	-----	-----	-----	-----	-----	
-----	8,000	-----	-----	-----	-----	-----	-----	-----	
1892	21,226	-----	-----	-----	-----	-----	-----	-----	
1884	2,562	-----	6,330.00	-----	-----	-----	-----	-----	
1894	1,371	2.00	4,539.00	-----	-----	-----	-----	-----	
1892	1,307	2.25	4,472.00	-----	0	0	0	0	
-----	3,200	-----	-----	-----	-----	-----	-----	-----	
1897	1,644	1.77	3,304.00	-----	-----	-----	-----	-----	
-----	10,000	-----	-----	-----	-----	-----	-----	-----	
1889	1,426	2.00	4,895.00	-----	-----	0.009	-----	0	
-----	6,000	-----	-----	-----	-----	-----	-----	-----	
1892	5,642	2.25	17,341.00	-----	-----	.0007	-----	0	
1890	3,311	2.00	9,140.00	-----	-----	.0007	-----	0	
1893	4,454	2.28	10,160.00	-----	-----	.045	-----	.07	
1880	6,802	4.47	12,421.00	1894	.119	.026	.017	-----	
-----	-----	-----	-----	1899	.517	-----	.005	.002	
1881	3,249	1.84	6,236.00	-----	-----	.004	-----	0	
1873	6,556	3.20	20,982.00	1878	1.24	-----	.04	-----	
-----	-----	-----	-----	1894	.70	-----	.29	-----	
1875	517	3.60	1,656.00	1898	1.177	-----	.036	.019	
-----	-----	-----	-----	-----	-----	.032	-----	-----	
1892	2,081	2.00	6,361.00	-----	0	0	0	0	4-inch base
1892	2,196	2.25	9,633.00	-----	0	0	0	0	

TABLE D.—*Descriptive list of street pavements and suburban roadways.*

Street.	From—	To—	Kind of pavement or roadway.
N, NW .....	Twenty-seventh .....	Twenty-eighth .....	Asphalt block .....
Do. ....	Twenty-eighth .....	Thirtieth .....	Asphalt .....
Do. ....	Thirtieth .....	Thirty-second .....	Asphalt, H. B. ....
Do. ....	Thirty-second .....	Thirty-fifth .....	do .....
N, SE .....	Canal .....	Third .....	Rubble .....
N, SW .....	do .....	do .....	Cobble .....
Do. ....	Third .....	Four-and-a-half .....	Asphalt, H. B. ....
Do. ....	Four-and-a-half .....	Sixth .....	do .....
Naylor road .....	do .....	do .....	Gravel .....
Newark .....	Tenallytown .....	road eastward .....	Macadam .....
Newark (Fort) .....	Bunker Hill .....	road eastward .....	Gravel .....
New Cut road .....	do .....	do .....	Macadam .....
New Hampshire avenue .....	G .....	Pennsylvania avenue .....	Rubble .....
Do. ....	Pennsylvania avenue .....	M .....	Asphalt, H. B. ....
Do. ....	M .....	P .....	do .....
Do. ....	P .....	Q .....	do .....
Do. ....	Q .....	R .....	Asphalt, B. B. ....
Do. ....	R .....	T .....	do .....
Do. ....	T .....	V .....	do .....
Do. ....	Rock Creek Church road .....	Omaha .....	do .....
New Jersey avenue .....	B, N .....	C, N .....	Coal tar .....
Do. ....	C .....	D .....	do .....
New Jersey avenue (east side) .....	C .....	D .....	Granite .....
New Jersey avenue .....	D .....	L .....	Asphalt, H. B. ....
Do. ....	L .....	New York avenue .....	do .....
Do. ....	M .....	Florida avenue .....	Coal tar .....
New Jersey avenue SE .....	B .....	E .....	Granite .....
Do. ....	I .....	M .....	Macadam .....
Do. ....	M .....	N .....	Gravel .....
New York avenue .....	North Capitol .....	New Jersey avenue .....	Asphalt, B. B. ....
Do. ....	New Jersey avenue .....	Seventh .....	do .....
Do. ....	Ninth .....	Fifteenth .....	do .....
Do. ....	do .....	Fourteenth .....	Asphalt, H. B. ....
New York avenue (north side) .....	Fourteenth .....	Fifteenth .....	Coal tar .....
New York avenue .....	Seventeenth .....	Eighteenth .....	do .....
Do. ....	Nineteenth .....	Twenty-third .....	Macadam .....
North Capitol .....	B .....	C .....	Asphalt, H. B. ....
Do. ....	D .....	E .....	Granite .....
Do. ....	E .....	Massachusetts avenue .....	Coal tar .....
Do. ....	Massachusetts avenue .....	I .....	do .....
Do. ....	I .....	K .....	do .....
Do. ....	K .....	M .....	Asphalt, H. B. ....
Do. ....	M .....	New York avenue .....	do .....
Do. ....	New York avenue .....	O .....	do .....
Do. ....	O .....	Q .....	do .....
North Capitol (west side) .....	P .....	Florida avenue .....	do .....
Do. ....	Florida avenue .....	R .....	do .....
Do. ....	R .....	T .....	Macadam .....
Nichols avenue .....	do .....	do .....	Granite .....
Do. ....	do .....	do .....	do .....
Do. ....	do .....	do .....	Gravel .....
North Carolina avenue SE .....	First .....	Second .....	Asphalt block .....
Do. ....	Third .....	Sixth .....	do .....
Do. ....	Sixth .....	Eighth .....	do .....
Do. ....	Eighth .....	Eleventh .....	do .....

repairs to asphalt pavements to July 1, 1901—Continued.

No.	Square yards.	Price per square yard.	Original cost.	Resurfaced.		Repairs—average annual cost per square yard.			Remarks.
				Year.	Cost per square yard.	Prior to resurfacing.	Since resurfacing.	Current year.	
9	1,015	\$1.77	\$2,541.00	-----	0	0	0	0	On asphalt block.
7	1,599	-----	2,597.00	-----	0	0	0	0	
0	3,525	1.84	6,599.00	-----	\$0.013	-----	\$0.027	-----	
0	5,689	1.84	10,760.00	-----	.016	-----	.024	-----	
6	11,224	{ 1.05 1.50 }	13,230.00	-----	-----	-----	-----	-----	
3	5,970	.70	4,179.00	-----	0	0	0	0	
0	2,619	1.80	5,770.00	-----	0	0	0	0	
7	2,301	1.56	5,897.00	-----	0	0	0	0	
1	13,000	-----	-----	-----	-----	-----	-----	-----	
	7,111	-----	-----	-----	-----	-----	-----	-----	
	1,400	-----	-----	-----	-----	-----	-----	-----	
	9,000	-----	-----	-----	-----	-----	-----	-----	
5	7,967	1.50	11,951.00	-----	-----	-----	-----	-----	
9	6,962	1.47	10,525.00	-----	-----	.015	-----	.005	
2	10,047	2.25	22,988.00	-----	-----	.034	-----	.08	
5	2,538	2.26	6,029.00	-----	-----	.011	-----	.009	
8	4,164	2.00	11,036.00	-----	-----	.046	-----	.083	
9	8,809	2.00	22,037.00	-----	-----	.003	-----	.009	
0	6,805	2.00	22,073.00	-----	-----	.0015	-----	0	
2	5,082	2.00	10,163.00	-----	0	0	0	0	Permit work.
7	2,862	2.15	6,203.00	{ 1885 1892 }	\$0.415	* .005	-----	-----	
7	2,385	2.17	5,175.00	-----	-----	-----	\$0.057	.011	
7	1,177	2.10	2,476.00	-----	-----	-----	.077	.033	
2	21,462	2.26	49,633.00	-----	-----	-----	.029	.035	
4	3,669	2.25	8,398.00	-----	-----	-----	.033	.077	
7	18,127	1.99	38,358.00	1895	.415	.037	.067	.051	
9	8,776	1.87	16,881.00	-----	-----	-----	-----	-----	
	5,500	-----	-----	-----	-----	-----	-----	-----	
	3,300	-----	-----	-----	-----	-----	-----	-----	
0	5,694	2.00	15,040.00	-----	-----	.006	-----	0	
9	9,229	2.00	25,723.00	-----	-----	.01	-----	.033	
2	22,317	3.20	71,416.00	-----	-----	-----	-----	-----	This street is so changed by removing of center parking that is practically a new pavement.
1	1,895	-----	-----	-----	-----	-----	-----	-----	Removing center parking.
8	1,862	3.00	5,589.00	1895	1.61	.031	.050	0	
3	3,510	3.20	11,231.00	1878	1.54	-----	.038	.039	
1	8,859	-----	-----	-----	-----	-----	-----	-----	
3	2,790	2.25	6,755.00	-----	-----	.034	-----	0	
6	2,336	-----	7,440.00	-----	-----	-----	-----	-----	
7	3,856	1.98	8,461.00	-----	-----	.031	-----	.084	
7	7,457	2.00	18,826.00	-----	-----	.028	-----	.053	
9	2,887	2.00	6,328.00	-----	-----	.03	-----	.04	
0	6,207	2.25	19,415.00	1899	.403	0	0	.007	
0	2,309	2.25	5,491.00	-----	0	0	0	0	
4	1,665	2.10	4,307.00	-----	-----	-----	-----	.005	
7	2,535	1.57	4,854.00	-----	0	0	0	0	
8	797	1.80	1,621.00	-----	0	0	0	0	
9	3,222	1.76	6,773.00	-----	0	0	0	0	
91	3,864	-----	6,368.00	-----	-----	-----	-----	-----	
84	2,990	-----	-----	-----	-----	-----	-----	-----	
91	3,823	-----	-----	-----	-----	-----	-----	-----	
	25,000	-----	-----	-----	-----	-----	-----	-----	
00	3,111	1.77	7,888.00	-----	-----	-----	-----	-----	
00	5,031	2.00	12,451.00	-----	-----	-----	-----	-----	
01	6,378	2.00	16,715.00	-----	-----	-----	-----	-----	
02	6,480	2.00	28,186.00	-----	-----	-----	-----	-----	

TABLE D.—Descriptive list of street pavements and suburban roadways.

Street.	From—	To—	Kind of pavement or roadway.
O, NW .....	North Capitol .....	First .....	Gravel .....
Do .....	First .....	Third .....	Asphalt, H. B. ....
Do .....	do .....	do .....	do .....
Do .....	New Jersey avenue .....	Vermont avenue .....	Coal tar .....
Do .....	Vermont avenue .....	Thirteenth .....	Asphalt, H. B. ....
Do .....	Fifteenth .....	Sixteenth .....	Coal tar .....
Do .....	Sixteenth .....	Seventeenth .....	Asphalt, H. B. ....
Do .....	Twentieth .....	Twenty-first .....	Coal tar .....
Do .....	Twenty-first .....	Twenty-second .....	Asphalt, B. B. ....
Do .....	Twenty-eighth .....	Twenty-ninth .....	do .....
Do .....	Twenty-ninth .....	Thirty-second .....	Asphalt, H. B. ....
Do .....	Thirty-second .....	Thirty-fifth .....	Granite .....
Do .....	Thirty-fifth .....	College gate .....	Coal tar .....
Oak .....	Brown .....	Center .....	Gravel .....
Do .....	Carroll avenue .....	Magnolia .....	do .....
Ohio avenue .....	Twelfth .....	Fourteenth .....	Cobble .....
Do .....	Fourteenth .....	Fifteenth .....	do .....
Olive .....	Twenty-eighth .....	Thirtieth .....	Asphalt block .....
Omaha .....	New Hampshire avenue .....	Fifth .....	Asphalt, B. B. ....
Do .....	Bunker Hill road .....	Thirteenth .....	Gravel .....
Ontario .....	Superior .....	Columbia road .....	do .....
P, NW .....	North Capitol .....	Fourth .....	Asphalt, B. B. ....
Do .....	New Jersey avenue .....	Ninth .....	Asphalt, H. B. ....
Do .....	Ninth .....	Fifteenth .....	do .....
Do .....	Fifteenth .....	Eighteenth .....	do .....
Do .....	Eighteenth .....	Twentieth .....	Coal tar .....
Do .....	Twentieth .....	Twenty-second .....	Granite .....
Do .....	Twenty-second .....	Rock Creek .....	Coal tar .....
Do .....	Rock Creek .....	340' west .....	do .....
Do .....	340' west of Rock Creek .....	Thirtieth .....	Granite .....
Do .....	Thirtieth .....	Thirty-second .....	do .....
Do .....	Thirty-second .....	Thirty-fifth .....	do .....
Do .....	Thirty-fifth .....	Thirty-sixth .....	Asphalt, H. B. ....
P, NE .....	North Capitol .....	Florida avenue .....	do .....
P, SW .....	Four-and-a-half .....	Water .....	Granite .....
Park .....	Fourteenth .....	Seventeenth .....	Macadam .....
Park place .....	B and C, NE .....	Eleventh and Twelfth .....	Gravel .....
Patterson .....	M and N .....	North Capitol and First .....	do .....
Pennsylvania avenue .....	First .....	Seventh .....	Asphalt, H. B. ....
Do .....	Seventh .....	Fifteenth .....	do .....
Do .....	Intersections .....	First to Fifteenth .....	do .....
Do .....	Fifteenth .....	Seventeenth .....	do .....
Do .....	Seventeenth .....	Eighteenth .....	Coal tar .....
Pennsylvania avenue (north side) .....	Eighteenth .....	Twenty-first .....	Asphalt, H. B. ....
Pennsylvania avenue .....	Twenty-first .....	Twenty-third .....	Coal tar .....
Pennsylvania avenue (south side) .....	Eighteenth .....	do .....	do .....
Pennsylvania avenue (north side) .....	Twenty-third .....	Twenty-sixth .....	do .....
Pennsylvania avenue .....	Twenty-sixth .....	Rock Creek .....	do .....
Pennsylvania avenue (south side) .....	Twenty-third .....	Twenty-fourth .....	Asphalt, H. B. ....
Pennsylvania avenue .....	Twenty-fourth .....	Twenty-sixth .....	do .....
Do .....	Rock Creek .....	M .....	Coal tar .....
Pennsylvania avenue, SE (north side) .....	Second .....	Eighth .....	Asphalt, B. B. ....
Pennsylvania avenue (south side) .....	do .....	Fourth .....	Asphalt, H. B. ....
Do .....	Fourth .....	Seventh .....	do .....
Pennsylvania avenue (north side) .....	Eighth .....	Eleventh .....	do .....
Pennsylvania avenue .....	do .....	do .....	Asphalt, B. B. ....

with repairs to asphalt pavements to July 1, 1901—Continued.

Year laid.	Square yards.	Price per square yard.	Original cost.	Resurfaced.		Repairs—average annual cost per square yard.			Remarks.
				Year.	Cost per square yard.	Prior to resurfacing.	Since resurfacing.	Current year.	
	2,750								Complete.
1899	3,028	\$1.76	\$5,184.00		0	0	0	0	
1900	925	1.78			0	0	0	0	
1875	13,361	3.20	43,714.00	1881	\$0.566	\$0.018	\$0.05	\$0.042	
1882	481	2.00	1,080.00			.063		0	
1875	1,663	3.00	4,988.00			.007		0	
1883	1,697	2.29	3,886.00			.052		0	
1887	2,011	1.97	5,131.00			.007		.026	
1889	2,398	2.00	1,966.00			0		.034	
1890	860	2.00	2,328.00		0	0	0	0	
1883	4,829	2.25	11,426.00			.044		.056	
1879	4,435	1.93	8,744.00						
1888	2,398	2.00	8,279.00			.018		.03	
	1,000								
1891	1,525								
1872	6,527	.70	4,570.00						
1874	2,642	.70	1,850.00						
1899	1,674	1.77	3,834.00						
1892	3,536	2.00	7,072.00		0	0	0	0	
	3,000								
1895	4,875								
1891	7,938	2.00	23,995.00		0	0	0	0	
1884	5,166	2.25	12,397.00			.061		.046	
1883	8,156	2.29	19,008.00			.057		.04	
1884	8,076	2.25	18,221.00	1901		.043		.01	
1873	1,569	3.20	5,021.00	{ 1878	1.01		.036	0	
1879	3,481	2.15	7,397.00	1896	.656		.047		
1872	1,078	3.20	3,452.00	{ 1881	1.30	.012	.108	0	
1872	1,590	3.20	5,088.00	1897	1.82				
1879	6,869	2.15	14,498.00	1887	1.314		.036	0	
1879	4,011	1.95	7,969.00						
1884	3,624	.85	4,655.00						
1900	938	1.78	2,721.00		0	0	0	0	
1896	2,539	1.63	7,294.00		0	0	0	0	
	2,000								
	6,000								
	1,700								
	2,700								
1890	28,486	1.184							
1890	33,974	1.184		1900	.099		.013	.007	
1877	16,061								
1890	11,497			1900	.68	0	0	0	
1871	5,520	3.26					.106	.025	
1896	5,884	2.18	16,252.00		0	0	0	0	
1875	9,423	3.20		{ 1886	.20	.02	.058		
				1888	.55		.023		
1875	10,078	3.20	37,290.00	1893	.13		.019	.005	
1877	7,383	2.67	19,713.00	1888	.364	.014			
1880	1,225	1.84	2,289.00	1894	.828		.045	.024	
1883	4,145	2.25	9,405.00			.053		.027	
1877	1,837					.033		.014	
1876	14,755	3.00	44,266.00	1882	1.45	.004	.022	.05	
1879	4,458	1.47	6,554.00			.005		.032	
1879	6,126	1.47	9,115.00			.042		.0006	
1883	5,320	2.33	12,781.00			.024		.072	
1888	5,400	2.00	11,896.00			.008		.034	

TABLE D.—*Descriptive list of street pavements and suburban roadways.*

Street.	From—	To—	Kind of pavement or roadway.
Pennsylvania avenue	Eleventh.....	Twelfth.....	Asphalt, H. B.
Do.	Twelfth.....	Bridge.....	Macadam
Do.	Eastern Branch.....	Branch avenue.....	Gravel
Phelps place	Bancroft.....	California.....	Asphalt, H. B.
Philadelphia	Bunker Hill road.....	Thirteenth.....	Gravel
Pierce.....	L and M.....	New Jersey avenue and North Capitol.....	Asphalt, B. B.
Pierce place	S and T.....	Fourteenth and Fifteenth.....	Coal tar
Do.	do.....	Fifteenth and Sixteenth.....	Asphalt
Piney Branch road.....			Gravel
Pleasant Drive.....			Macadam
			(Gravel)
Polk.....			do
Pomeroy.....	Brightwood avenue.....	East.....	Asphalt, B. B.
Portner place.....	U and V.....	Fourteenth and Fifteenth.....	Asphalt block
Potomac.....	M.....	Prospect.....	Granite
Do.	do.....	do.....	do
Do.	Prospect.....	O.....	Asphalt, H. B.
Princeton.....	Thirteenth.....	Fourteenth.....	Asphalt block
Do.	Brightwood avenue.....	Thirteenth.....	Gravel
Providence.....	Ninth.....	do.....	Macadam
Q, NW.....	Third.....	New Jersey avenue.....	Asphalt, B. B.
Do.	New Jersey avenue.....	Fifth.....	Coal tar
Do.	Fifth.....	Sixth.....	Asphalt, B. B.
Do.	Sixth.....	Rhode Island avenue.....	Coal tar
Do.	Rhode Island avenue.....	Vermont avenue.....	Asphalt, H. B.
Do.	Fourteenth.....	Sixteenth.....	Coal tar
Do.	Sixteenth.....	Seventeenth.....	do
Do.	Seventeenth.....	Nineteenth.....	Asphalt, B. B.
Do.	Nineteenth.....	Twentieth.....	Coal tar
Do.	Twentieth.....	Twenty-first.....	do
Do.	Massachusetts avenue.....	Twenty-second.....	do
Do.	do.....	Twenty-first.....	do
Do.	Twenty-eighth.....	Thirtieth.....	Asphalt, B. B.
Do.	Thirtieth.....	Valley.....	Coal tar
Do.	Valley.....	Thirty-second.....	do
Do.	Thirty-second.....	Thirty-fifth.....	Asphalt, B. B.
Q, NE.....	Lincoln avenue.....	Eckington place.....	Asphalt, H. B.
Quarry road.....	Columbia road.....	Zoo Park.....	Macadam
Queen's Chapel road.....			Gravel
Quincy.....	Lincoln avenue.....	Eckington place.....	Asphalt, H. B.
Do.	Third, E.....	Eckington line.....	do
Do.		Brightwood avenue east.....	Macadam
R, NW.....	Florida avenue.....	Lincoln avenue.....	Asphalt, B. B.
Do.	do.....	Seventh.....	Asphalt, H. B.
Do.	Seventh.....	Ninth.....	do
Do.	Ninth.....	Fourteenth.....	Coal tar
Do.	Fourteenth.....	Sixteenth.....	Asphalt, H. B.
Do.			Coal tar
Do.	Sixteenth.....	New Hampshire avenue.....	Asphalt, B. B.
Do.	New Hampshire avenue.....	Twentieth.....	Asphalt, H. B.
Do.	Connecticut avenue.....	Twenty-first.....	Coal tar
Do.	Twenty-first.....	Florida avenue.....	Asphalt, H. B.
Do.	Florida avenue.....	Massachusetts avenue.....	Gravel
Do.	Thirty-second.....	Thirty-fourth.....	Asphalt block
Do.	Thirty-fourth.....	Thirty-fifth.....	do
R, NE.....	Lincoln avenue.....	Fourth.....	Asphalt
Do.	Fourth.....	Brightwood road.....	Asphalt, H. B.
Randolph.....	North Capitol.....	First.....	Macadam

Repairs to asphalt pavements to July 1, 1901—Continued.

Square yards.	Price per square yard.	Original cost.	Resurfaced.		Repairs—average annual cost per square yard.			Remarks.
			Year.	Cost per square yard.	Prior to resurfacing.	Since resurfacing.	Current year.	
2,287	\$1.79	\$5,747.00		0	0	0	0	
25,027	.55	28,707.00						
25,000				0	0	0	0	
1,164								
3,300								
5,335	2.00	16,078.00			\$0.0005		\$0.0025	
2,154	3.20	6,993.00	1886	\$1.65	.033	\$0.045	0	
1,366	2.00	4,521.00		0	0	0	0	
4,000								
4,000								
1,400								
2,560	2.00	7,662.00			.005		0	
1,025								
664		1,852.00						
389	1.93	788.00						
1,840	2.25	4,332.00			.07		.071	
2,333	1.77	4,717.00						
6,300								
4,426								
1,812	2.00	6,518.00		0	0	0	0	
2,031	2.00	4,870.00			.022		.05	
833	2.00	2,088.00			.009		0	
4,758	1.98	13,030.00	{ 1896	.73	.054			
			{ 1900	1.126		.123	0	
2,806	2.25	6,452.00			.034		.094	
4,806	3.20	15,378.00	{ 1886	.705	.006	.065		
			{ 1892	.57		.013	0	
2,301	3.00	6,903.00	1895	1.415	.027	.104		
4,904	2.00	10,744.00			.022		.017	
802	3.20	2,760.00	{ 1882	.715	.08	.009		
			{ 1888	1.40		.06	0	
2,541	1.97	5,632.00	1900	1.336	.044		.017	
883	3.00	2,640.00			.013		.193	
2,000	2.00	6,608.00			.0015		0	
3,943	1.98	11,551.00			.007		0	
1,067	1.98	3,884.00			.026		0	
4,002	2.00	16,136.00		0	0	0	0	
3,933	2.25	12,786.00		0	0	0	0	
3,500								
18,000								
3,670	2.25	11,580.00		0	0	0	0	
919	2.25	3,245.00		0	0	0	0	
2,013								
3,051	2.00				.009		0	
2,040	2.25	14,776.00						
8,483	2.25	29,713.00		0	0	0	0	
1,602	2.00	4,062.00			.035			
7,638	2.25	17,249.00			.037		.074	
4,502	3.00	13,507.00	1806	1.99	.01		0	
4,155	2.00	14,873.00			.0013		0	
3,498	2.25	12,258.00		0	0	0	0	
1,411	1.98	3,583.00			.051		0	
733	2.25	2,248.00		0	0	0	0	
2,100								
2,114	1.77	5,618.00						
965	1.77	2,681.00						
8,555					.01		.04	
2,321	2.25	6,969.00		0	0	0	0	
2,700								

Private expense.  
Permit work.

TABLE D.—*Descriptive list of street pavements and suburban roadways.*

Street.	From—	To—	Kind of pavement or roadway.
Randolph	Second, E	Fourth	Asphalt
Rhode Island avenue	New Jersey avenue	Florida avenue, east	Asphalt, H. B.
Do.	do	Fifth	Asphalt, B. B.
Do.	Fifth	Ninth	Asphalt, H. B.
Do.	Ninth	Thirteenth	do
Do.	Thirteenth	Sixteenth	do
Do.	Around Scott square.		Coal tar
Do.	Sixteenth	Connecticut avenue	do
Ridge	M and N	Fourth and Fifth	Asphalt, B. B.
Ridge road			Gravel
Riggs	R and S	Thirteenth and Fourteenth	Asphalt block
Do.	do	Sixteenth and Seventeenth	Asphalt, H. B.
Do.	do	New Hampshire avenue and Nineteenth	do
Robinson	L and M	Sixth and Water	Gravel
Rock Creek Church road.			Macadam
Do.			Gravel
S, NW	North Capitol	First	Macadam
Do.	Florida avenue	Seventh	Asphalt, H. B.
Do.	Seventh	Eleventh	Coal tar
Do.	Eleventh	Fourteenth	do
Do.	Fourteenth	Sixteenth	do
Do.	Sixteenth	New Hampshire avenue	Asphalt, B. B.
Do.	New Hampshire avenue	Twentieth	Asphalt, H. B.
Do.	Twentieth	Connecticut avenue	Asphalt, B. B.
Do.	Florida avenue	Phelps place	do
Do.	Phelps place	Twenty-third	Asphalt, H. B.
S, NE	Second	Brentwood road	Asphalt
Seaton, NE	do	Fourth	do
Do.	Sixth	Brentwood road	do
Seaton, NW	North Capitol	First	Macadam
Sampson	P and Q	Fourteenth and Fifteenth	Asphalt, B. B.
Sargent road			Gravel
School	D and E	Four-and-a-half and Sixth	Macadam
Do.	Park	Grant	do
Sheridan			do
Sherman			do
Spruce and Bohrer	Florida avenue	Larch	Asphalt, H. B.
Spruce	Larch	Harewood	do
Spring	Morris road	Arthur	Gravel
Stauben	Brightwood avenue	Sherman	Macadam
Stoughton	Fourteenth	Alley west of Fourteenth	Asphalt block
Do.	Alley	Westward	Granite
Do.		West to Fifteenth	Asphalt, B. B.
Sunderland place	N and O	Nineteenth and Twentieth	Asphalt block
Superior	Champlain	Sixteenth	Gravel
T, NW	Florida avenue	Seventh	Asphalt, H. B.
Do.	Seventh	Ninth	do
Do.	Ninth	Tenth	do
Do.	Tenth	Fourteenth	do
Do.	Fourteenth	New Hampshire avenue	do
Do.	New Hampshire avenue	Florida avenue	Macadam
Do.	do		
Do.	Second	Eckington line	Asphalt, B. B.
Tenleytown road			Macadam
Tennessee avenue	East Capitol	B	Asphalt, H. B.
Do.	B	D	Gravel

pairs to asphalt pavements to July 1, 1901—Continued.

Square yards.	Price per square yard.	Original cost.	Resurfaced.		Repairs—average annual cost per square yard.			Remarks
			Year.	Cost per square yard.	Prior to re-surfacing.	Since re-surfacing.	Current year.	
2,000				0	0	0	\$0.011	Private expense.
1,146	\$1.54	\$2,580.00		0	0	0	0	
2,318	2.00	5,459.00			\$0.011		.023	
8,120					.048		.041	
9,219	2.26	21,077.00			.028		0	
7,723	1.84	14,574.00			.045		.006	
12,800	3.20	40,919.00	1888	\$0.83	.08	\$0.0071	0	
			1900	1.017		0	0	
			1878	1.35		.025		
5,411	3.20	17,314.00	1888	1.742		.148		
			1896	1.60		.0014	.0013	Do.
2,518	2.00	9,558.00		0		.0016	0	
15,000								
2,630				0	0	0	0	
1,620	2.25	5,079.00		0	0	0	0	
2,555	1.63	5,508.00		0	0	0	0	
960								
20,000								
13,000								Do.
3,000								
4,539	2.10	11,937.00		0	0	0	0	
5,058	2.00	14,626.00	1901	1.13	.011	0	0	
5,135	3.00	15,405.00	1892	1.045	.02	0	0	
			1900	.44	.045		0	
4,214	3.20	13,485.00	1889	.55	.023	.051	.009	
2,681	2.00	5,734.00	1894	.883		.036	.07	
5,004	2.10	14,295.00		0	0	0	0	
1,077	2.00	3,647.00		0	0	0	.017	Do.
1,037	2.00			0	0	0	0	
2,681	1.795	6,014.00		0	0	0	0	
5,800				0	0	0	0	
2,800				0	0	0	0	
1,000				0	0	0	0	
2,600								
1,733					.0016		.0006	
9,000								
2,000								Permit work.
2,000								
2,700								
20,000								
2,319	1.564	6,408.00		0	0	0	0	
2,064	1.80	4,289.00		0	0	0	0	
1,600								
2,712	1.06	4,923.00						
483								
755								Do.
1,099				0	0	0	0	
1,185								
5,800								
1,332	1.56	3,317.00		0	0	0	0	
1,556	1.63	3,780.00		0	0	0	0	
1,786	2.25	5,210.00		0	0	0	0	
5,256	2.00	10,805.00		0	0	0	0	
5,146	1.68	13,990.00		0	0	0	0	
5,300								Private expense.
6,800				0	0	0	.023	
48,700								
2,713	1.76	6,718.00						
4,500								

TABLE D.—*Descriptive list of street pavements and suburban roads*

Street.	From—	To—	Kind of pavement or road
Thomas .....	Sixth .....	Eckington line .....	Asphalt, B. B.
Trinidad .....	King's subdivision .....	King's subdivision .....	Macadam .....
Tunlaw road .....	Le Droit (Second) eastward .....	Le Droit (Second) eastward .....	Gravel .....
U, NW .....	Ninth .....	Tenth .....	Asphalt, H. B.
Do .....	Tenth .....	Fourteenth .....	do .....
Do .....	Fourteenth .....	Sixteenth .....	do .....
Do .....	Sixteenth .....	Eighteenth .....	do .....
Do .....	Twenty-eighth .....	Thirty-first .....	Macadam .....
Do .....	Thirty-first .....	Thirty-second .....	Asphalt, H. B.
Do .....	Thirty-second .....	Thirty-fifth .....	do .....
Union .....	M and O .....	Four-and-a-half and Sixth .....	Cobble .....
University place .....	Welling .....	Huntington .....	Asphalt, H. B.
V, NW .....	Thirteenth .....	Fourteenth .....	do .....
Do .....	Fourteenth .....	Fifteenth .....	do .....
Valley .....	P .....	U .....	Asphalt block .....
Van .....	Third .....	Four-and-a-half .....	do .....
Vermilion .....	Piney Branch road .....	Baltimore and Ohio R. R. .....	Gravel .....
Vernon .....	Eighteenth .....	Nineteenth .....	Asphalt, B. B.
Virginia avenue, NW .....	Intersection of B. .....	Intersection of B. .....	Asphalt, H. B.
Do .....	E .....	G .....	do .....
Do .....	G .....	Twenty-seventh .....	Gravel .....
Virginia avenue, SE .....	Second .....	Third .....	Macadam .....
Do .....	Third .....	Eleventh .....	Gravel .....
Virginia avenue, SW .....	South Capitol .....	Delaware avenue .....	Asphalt, H. B.
Do .....	Second .....	Four-and-a-half .....	Gravel .....
Do .....	Four-and-a-half .....	Seventh .....	do .....
Do .....	Ninth .....	Twelfth .....	Granite .....
Vermont avenue .....	H .....	I .....	Coal tar .....
Do .....	K .....	M .....	do .....
Do .....	M .....	P .....	do .....
Do .....	P .....	R .....	Asphalt, H. B.
Do .....	R .....	T .....	Macadam .....
Do .....	Intersection of N. .....	Intersection of N. .....	Asphalt, B. B.
Do .....	T .....	Florida avenue .....	Gravel .....
W, NW .....	Twelfth .....	Thirteenth .....	Asphalt, H. B.
Do .....	Thirteenth .....	Fifteenth .....	do .....
Wallach .....	T and U .....	Thirteenth and Fourteenth .....	Asphalt block .....
Ward place .....	M and N .....	New Haven and Twenty-second .....	Asphalt, B. B.
Washington .....	G and H .....	Fourth and Fifth .....	do .....
Do .....	Nichols avenue .....	Taylor .....	Gravel .....
Water .....	Seventh .....	Twelfth .....	Granite .....
Do .....	N .....	O .....	do .....
Do .....	M .....	Sixth .....	do .....
Water (south side) .....	P, westward .....	P, westward .....	Vitrified block .....
Water .....	Twelfth .....	Thirteen-and-a-half .....	Granite .....
Welling .....	Fourteenth .....	University place .....	Asphalt, H. B.
Whitney avenue .....	do .....	Brightwood avenue .....	Macadam .....
Do .....	Brightwood avenue, eastward .....	Brightwood avenue, eastward .....	do .....
Willard .....	T and U .....	Seventeenth and Eighteenth .....	Gravel .....
Westminster .....	S and T .....	Ninth and Tenth .....	Asphalt, B. B.
Wyoming .....	Eighteenth .....	Columbia road .....	do .....
Do .....	Columbia road, westward .....	Columbia road, westward .....	do .....
One-half, SE .....	I .....	N .....	Macadam .....
One-half, SW .....	G .....	do .....	do .....

repairs to asphalt pavements to July 1, 1901—Continued.

Square yards.	Price per square yard.	Original cost.	Resurfaced.		Repairs—average annual cost per square yard.			Remarks.
			Year.	Cost per square yard.	Prior to resurfacing.	Since resurfacing.	Current year.	
2,000								
3,206								
11,000								
1,987	\$1.78	\$3,024.00						
2,547	2.26	8,456.00			\$0.01		\$0.0036	
4,806	2.25	10,815.00		0	0	0	0	
3,310	2.26	12,702.00			.002		0	
1,543	1.63	10,742.00		0	0	0	0	
2,900	1.63							
5,700				0	0	0	0	4-inch base.
4,226	1.94	11,415.00		0	0	0	0	Do.
3,371	1.93	8,262.00		0	0	0	0	
5,333				0	0	0	0	
1,957	1.77	4,818.00		0	0	0	0	
2,123	1.53	10,891.00		0	0	0	0	4-inch hydraulic base.
2,415	1.68							
3,849	1.78	8,625.00						
1,177	1.77	3,335.00						
4,000				0	0	0	0	
1,888				0	0	0	0	
443	1.69	1,439.00		0	0	0	0	
397	1.94	19,906.00		0	0	0	0	
8,327	2.19							
7,200								
1,086	.75	3,306.00						
10,894		12,333.00						
1,850	1.56	4,863.00		0	0	0	0	
5,000								
2,500								
2,500								
3,896	2.31	11,799.00	1880	\$1.175	.0096		.0025	
4,156			1873			\$0.019		
6,536	3.20	20,917.00	1882	1.14		.027		
			1894	.25		.036	.012	
6,150	3.20	19,679.00	1893	1.34	.028	.014	.011	
6,103	2.00	16,374.00			.039		.069	
4,854	.40	5,851.00						
338	1.78	602.00		0	0	0	0	
5,500								
1,358	1.63	3,881.75		0	0	0	0	
4,368	1.80	11,046.00		0	0	0	0	
2,075								
1,505	2.00	4,148.00		0	0	0	0	
2,128	2.00	8,159.00						
7,000				0	.014	0	0	
16,858		52,280						
3,359		11,758						
3,526		16,848						
2,943		4,066						
3,110		4,828						
1,731	2.25	4,483		0	0	0	0	
7,000								
5,000								
2,000								
1,749	2.00			0	0	0	0	
2,526				0	0	0	0	
3,900								
6,000								
6,516								

<sup>1</sup> Eight-inch base.

TABLE D.—*Descriptive list of street pavements and suburban roadways.*

Street.	From—	To—	Kind of pavement or roadway.
First, NW .....	Maryland avenue .....	Pennsylvania avenue .....	Asphalt, H. B. ....
Do .....	Pennsylvania avenue .....	F .....	Granite .....
Do .....	B .....	C .....	Asphalt block .....
Do .....	do .....	do .....	Vitrified block .....
Do .....	Massachusetts avenue .....	H .....	do .....
Do .....	H .....	Defrees .....	Asphalt .....
Do .....	Defrees .....	I .....	Granite .....
Do .....	I .....	K .....	Asphalt, B. B. ....
Do .....	K .....	Pierce .....	Asphalt, H. B. ....
Do .....	Pierce .....	New York avenue .....	do .....
Do .....	New York avenue .....	O .....	do .....
Do .....	O .....	P .....	do .....
Do .....	Q .....	Florida avenue .....	do .....
Do .....	Florida avenue .....	S .....	Asphalt .....
Do .....	S .....	W .....	do .....
Do .....	W .....	Michigan avenue .....	do .....
First, E. ....	B, North .....	B, South .....	do .....
First, NE .....	B .....	C .....	Asphalt, H. B. ....
Do .....	C .....	F .....	Asphalt, B. B. ....
Do .....	F .....	L .....	Gravel .....
Do .....	Q .....	R .....	Asphalt, H. B. ....
Do .....	R .....	Alley .....	do .....
First, SE .....	B .....	C .....	Granite .....
Do .....	C .....	D .....	Asphalt block .....
Do .....	D .....	E .....	Asphalt, H. B. ....
Do .....	E .....	G .....	Asphalt block .....
Do .....	I .....	River .....	Gravel .....
First, SW .....	Maryland avenue .....	Virginia avenue .....	Trap .....
Do .....	Virginia avenue .....	M .....	do .....
Do .....	M .....	N .....	Rubble .....
Do .....	N .....	River .....	Gravel .....
Second, NW .....	Pennsylvania avenue .....	Indiana avenue .....	Granite .....
Do .....	Indiana avenue .....	I .....	Asphalt, H. B. ....
Second (Le Droit ave- nue) .....	Florida avenue .....	W .....	do .....
Second, NE. and SE .....	Pennsylvania avenue .....	Maryland avenue .....	do .....
Second, NE .....	Maryland avenue .....	C .....	Asphalt block .....
Do .....	C .....	F .....	do .....
Do .....	F .....	H .....	Asphalt, B. B. ....
Do .....	K .....	L .....	Gravel .....
Do .....	R .....	T .....	Asphalt, B. B. ....
Second, SE .....	Pennsylvania avenue .....	D .....	Asphalt, H. B. ....
Do .....	do .....	G .....	Macadam .....
Do .....	Virginia avenue .....	I .....	do .....
Do .....	K .....	L .....	do .....
Second, SW .....	Maryland avenue .....	C .....	Asphalt, H. B. ....
Do .....	C .....	Virginia avenue .....	Asphalt, B. B. ....
Do .....	Virginia avenue .....	F .....	Asphalt, H. B. ....
Do .....	F .....	Delaware avenue .....	Macadam .....
Third, NW .....	Pennsylvania avenue .....	D .....	Granite .....
Do .....	Intersection of D. ....	do .....	Asphalt, H. B. ....
Do .....	D .....	L .....	Asphalt, B. B. ....
Do .....	L .....	New York avenue .....	Asphalt, H. B. ....
Do .....	New Jersey avenue .....	P .....	do .....
Do .....	P .....	Q .....	do .....
Do .....	Q .....	R .....	do .....

with repairs to asphalt pavements to July 1, 1901—Continued.

Year laid.	Square yards.	Price per square yard.	Original cost.	Resurfaced.		Repairs—average annual cost per square yard.			Remarks.
				Year.	Cost per square yard.	Prior to resurfacing.	Since resurfacing.	Current year.	
1883	4,540	\$2.24	\$10,480.00	1886	\$1.40	\$0.048	\$0.17	\$0.081	Macadam base. Four-inch base.
1879	7,280	1.87	15,680.00						
1883	475								
1883	577								
1882	1,427	2.30	3,519.00						
1877	700	1.98	1,386.00			.023		.014	
1882	535	2.41	1,310.00						
1880	1,191	2.00	3,028.00			.000		0	
1884	3,051	1.68	7,457.00		0	0	0	0	
1880	1,731	1.76	4,880.00		0	0	0	0	
1901	2,728	1.79	6,687.00		0	0	0	0	Laid by property owners. Originally laid with coal tar in 1873. Relaid with new pavement and asphalt surface in 1897. Includes entrances to Capitol grounds.
1886	1,160	1.63	2,172.00		0	0	0	0	
1901	1,077	1.795	2,451.00						
1882	1,898	1.20	3,411.00					.013	
1886	7,385	1.94	15,577.00		0	0	0		
								.003	
1893	10,432								
1873	8,822			1897					
1881	1,987	1.85	3,736.00			.004		.006	Permit work.
1891	5,616	2.00	13,995.00			.0005		.0036	
	4,500								
1892	2,206	2.25	7,358.00		0	0	0	0	
1892	528	2.25	1,437.00		0	0	0	0	
1880	2,152	1.81	3,935.00						
1889	1,280	2.00	2,631.00						
1896	2,001	1.68	3,980.00			.006			
1900	1,652	1.77	4,351.00						
	10,200								
1874	6,721	3.50	23,524.00						Do.
1876	11,196	3.50	39,194.00						
1876	2,315	1.06	2,430.00						
	13,750								
1881	3,698	1.87	7,137.00						
1881	10,452	2.08	22,534.00			.044		.028	
1882	6,051	2.25	18,454.00		0	0	0	0	
1881	4,751	2.09	10,589.00	1888	1.45	.028	.018	.028	
1887	1,846	1.98	4,787.00						
1894	4,323	2.00	10,788.00						
1891	3,584	2.00	7,568.00			.004		0	
	1,068								
1890	4,214	2.00	8,702.00		0	0	0	0	
1882	4,906	2.27	11,372.00			.035		.154	
1891	2,099	.98	4,635.00						
1892	1,206	.95	2,115.00						
1901	1,219				0	0	0	.006	
1892	2,532	2.25	10,013.00		0	0	0		
1890	3,179	2.00	12,235.00			.023		0	
1891	511	2.25	2,227.00		0	0	0	0	
1889	4,627	.57	5,171.00						
1880	4,231	1.72	7,518.00						
1880	436		800.00		0	0	0	0	
				1883	1.42	.014			
1875	16,359	3.00	52,631.00	1884	.08		.03	.024	
1879	2,685	1.78	4,779.00			.038		.028	
1882	4,177	2.25	12,358.00		0	0	0	0	
1880	2,077	1.80	5,497.00		0	0	0	0	
1900	529	1.80	1,798.00		0	0	0	0	

TABLE D.—Descriptive list of street pavements and suburban roadways.

Street.	From—	To—	Kind of pavement or roadway.
Third, NW	R	Florida avenue	Asphalt, H. B.
Third, NW (Harewood avenue).	Florida avenue	Elm	Gravel
Third, NE	East Capitol	Maryland avenue	Asphalt, H. B.
Do	Maryland avenue	C	Asphalt block
Do	C	F	Asphalt, B. B.
Do	F	H	Asphalt, H. B.
Do	Quincy	R	do
Do	R	T	Asphalt
Third, SE	East Capitol	Pennsylvania avenue	Asphalt, H. B.
Do	Pennsylvania avenue	C	Asphalt block
Do	C	D	Granite
Do	D	Virginia avenue	Belgian
Do	M	N	Rubble
Do	Virginia avenue	K	Granite
Do	K	M	Macadam
Third, SW	Pennsylvania avenue	B south	Granite
Do	B	Virginia avenue	Asphalt, H. B.
Do	Virginia avenue	F	do
Do	F	H	do
Do	H	I	do
Do	I	K	do
Do	K	N	do
Fourth (John Marshall place).	Pennsylvania avenue	D	Asphalt block
Fourth, NW	do	Missouri avenue	Asphalt, H. B.
Do	Indiana avenue	New York avenue	Coal tar
Do	New York avenue	New Jersey avenue	Granite
Do	New Jersey avenue	Florida avenue	Asphalt, H. B.
Fourth (Linden)	Florida avenue	Maple	do
Fourth, NW	Maple	College	Macadam
Fourth, NE	East Capitol	Maryland avenue	Asphalt block
Do	Maryland avenue	Massachusetts avenue	do
Do	Massachusetts avenue	D	do
Do	D	F	do
Do	F	H	Gravel
Do	H	K	Asphalt, H. B.
Do	K	L	do
Do	Extension to L.		do
Do	L	M	Gravel
Do	R	Baltimore and Ohio R. R.	Asphalt, H. B.
Do	Baltimore and Ohio R. R.	Eckington line	Asphalt
Do	Eckington line	Bunker Hill road	Gravel
Fourth, SE	East Capitol	Pennsylvania avenue	Asphalt
Do	Pennsylvania avenue	North Carolina avenue	Asphalt block
Do	North Carolina avenue	Virginia avenue	do
Do	Virginia avenue	N	do
Four-and-a-half, SW	Missouri avenue	Maryland avenue	Asphalt, B. B.
Do	Maryland avenue	H	Granite
Do	H	P	do
Fifth, NW	D	G	Asphalt, H. B.
Do	F	do	do
Do	do	do	do
Do	G	New York avenue	Coal tar
Do	do	do	Asphalt, H. B.
Do	New York avenue	O	Asphalt, B. B.
Do	O	Q	do

Repairs to asphalt pavements to July 1, 1901—Continued.

Square yards.	Price per square yard.	Original cost.	Resurfaced.		Repairs—average annual cost per square yard.			Remarks.
			Year.	Cost per square yard.	Prior to resurfacing.	Since resurfacing.	Current year.	
2,305 4,300	\$1.795	\$5,183		0	0	0	0	
3,121	2.25	7,437			\$0.045		\$0.012	
1,090	1.99	2,977		0	0	0	0	
4,314	2.00	10,850			.0018		.0013	
3,834	2.25	9,164		0	0	0	0	
1,133	2.25	3,377		0	0	0	0	Permit work.
3,000				0	0	0	0	Private expense.
3,521	2.09	7,791			.04		.085	
987	1.99	2,562						
2,572	2.20	5,690						
5,090	3.50							
2,017	1.08	17,607						
2,467		9,400						
2,000								
5,941	1.82	11,008						
5,890	2.25	17,548	1901	\$1.936	.058	0	0	
2,088	2.25	6,968			.032		.058	
2,947	1.68	5,460		0	0	0	0	
1,342	1.63	2,699		0	0	0	0	
1,472	1.56	3,087		0	0	0	0	
6,325	1.76	13,598		0	0	0	0	
4,549	2.00	14,609						
2,287				0	0	0	0	In place of coal tar.
14,291	3.20	45,732	1878	1.39	\$0.019			
			1888	.37	.014			
			1891	.325	.013		.0047	
2,400								
4,594	2.25	13,538		0	0	0	0	
2,145	2.25	6,952		0	0	0	0	
5,038								
2,537								
4,526	2.10	10,228						
1,912	2.00	4,472						
837	2.00	1,972.00						
3,101	1.77	7,277.19						
3,620								
3,021	1.68	6,120.00		0	0	0	0	
781	1.57	2,455.00		0	0	0	0	
1,067	1.76	2,060.00		0	0	0	0	
2,400								
861	2.25	2,867.00		0	0	0	0	Permit-work.
4,700				0	0	0	0	Private expense.
17,000								
4,152				0	0	0	0	On asphalt block.
593	2.00	1,389.00						
6,684	1.77	15,894.00						
7,706	1.77	18,630.00						
4,833	2.00	18,978.00			.041		.032	
12,851	2.29	30,527.00						
14,506	1.68	48,423.00						
3,341	2.25	11,562.00	1894	.48	.02	.036		
380	2.18		1895	.38		.011	.018	Widening east side.
				0	0	0	0	
200				0	0	0	0	Widening westside.
7,389	3.20	23,644.00	1878	1.71	.017			
			1887	.529	.023		0	
1,795				0	0	0	0	Widening.
5,666	1.46	8,793.00			.024			
3,123	2.00	7,764.00			.021		.037	

TABLE D.—*Descriptive list of street pavements and suburban roadways.*

Street.	From—	To—	Kind of pavement or roadway.
Fifth, NW	Q	Florida avenue	Asphalt, B. B.
Fifth (Larch)	Florida avenue	Maple (T)	do
Do	Maple	Spruce	do
Fifth, NE	East Capitol	Stanton square	Asphalt block
Do	Stanton square	D	do
Do	D	Florida avenue	Gravel
Fifth, SE	East Capitol	Pennsylvania avenue	Asphalt, H. B.
Do	Crossing square at	Pennsylvania avenue	Asphalt block
Do	C	E	Asphalt, H. B.
Do	E	G	Asphalt block
Do	G	Virginia avenue	Gravel
Sixth, NW	Missouri avenue	Louisiana avenue	Asphalt, H. B.
Do	Louisiana avenue	E	Asphalt, B. B.
Do	E	F	Asphalt, H. B.
Do	F	G	Granite
Do	G	New York avenue	Coal tar
Do	New York avenue	Florida avenue	Asphalt, H. B.
Do	Florida avenue	Spruce	do
Do	Pomeroy	Lincoln	Gravel
Sixth, NE	East Capitol	Maryland avenue	Asphalt block
Do	Maryland avenue	Massachusetts avenue	do
Do	do	D	do
Do	D	F	Gravel
Do	F	H	Asphalt, H. B.
Do	K	Florida avenue	Gravel
Do	Brentwood road	Eckington line	Asphalt
Sixth, SE	East Capitol	Pennsylvania avenue	Asphalt block
Do	Pennsylvania avenue	C	do
Do	C	Virginia avenue	do
Sixth, SW	Missouri avenue	C, south	Rubble
Do	C	Water	Granite
Six-and-a-half, SW	C	E	Asphalt block
Seventh, NW	B	Pennsylvania ave	Granite
Seventh, NW (west side)	Market space	D	do
Seventh, NW	Pennsylvania avenue	D	Coal tar
Do	(East side, Market space to D.)		
Do	D to E and G to Q.		Granite
Do	Intersections G, H, and I.		do
Do	E	G	Asphalt, H. B.
Seventh, NW (west side)	Q	Florida avenue	Granite
Seventh, NW	Q	do	do
Seventh, NE	East Capitol	Massachusetts avenue	Asphalt block
Do	Massachusetts avenue	Maryland avenue	do
Do	Maryland avenue	Florida avenue	Gravel
Seventh, SE	East Capitol	Pennsylvania avenue	Asphalt block
Do	Pennsylvania avenue	Virginia avenue	do
Do	Virginia avenue	M	Macadam
Seventh, SW	B, N	B, S	Trap
Do	B, S	Water	Granite
Eighth, NW	Pennsylvania avenue	E	do
Do	E	F	Concrete
Do	G	L	Asphalt, H. B.
Do	L	N	Asphalt, B. B.
Do	N	R	Asphalt, H. B.
Do	R	S	Coal tar
Do	S	Florida avenue	do
Do	Florida avenue	Grant avenue	Macadam
Eighth, NE	East Capitol	Massachusetts avenue	Asphalt block
Do	Massachusetts avenue	Maryland avenue	do
Do	Maryland avenue	I	Gravel
Do	I	K	Macadam

pairs to asphalt pavements to July 1, 1901—Continued.

Square Yards.	Price per square yard.	Original cost.	Resurfaced.		Repairs—average an- nual cost per square yard.			Remarks.
			Year.	Cost per square yard.	Prior to re- surfacing.	Since resur- facing.	Cur- rent year.	
4,436	\$2.00	\$11,654.00			\$0.02		\$0.044	
1,516	2.00	4,334.00			.008			
734	2.00	1,878.00		0	0	0	0	
4,876	2.10	12,131.00						
875	2.00	2,060.00						
12,500								
4,916	2.27	11,493.00			.027		.16	
693	2.00	1,675.00						
2,570	1.93½	5,679.00		0	0	0	0	4-inch base.
1,851	1.77	4,954.00		0	0	0	0	
2,140								
5,078	2.25	14,037.00	1900	\$1.45	.034		0	Includes 1,099 yards of granite.
2,987	1.98	5,915.00	1882	.80	.011	\$0.033		
1,313	1.78	2,337.00	1900	1.06	0	0	0	
975	1.71	1,665.00	1889	2.10	.025	.014	.032	Covered with as- phalt binder, 1895.
6,896	1.97	17,992.00	1899	1.01	.047	.12		
16,636	1.85	31,645.00	1901	.92			0	
907	1.76	2,402.00		0	.015		.02	
7,000				0	0	0	0	
4,626	2.10	10,800.00						
1,998	2.00	4,696.00						
838	2.00	1,975.00						
3,000								
3,640	1.80	10,045.00		0	0	0	0	
4,160								
4,000				0	0	0	0	
5,949	2.10	13,787.00						
4,399	1.99	10,430.00						
4,775	2.00	12,151.00						
8,940								
23,179	3.45	79,768.00						
1,477	1.77	4,409.00						
1,555	1.70	2,643.00						
507	1.63½	838.00						
1,579	3.00	4,738.00	1881	.78		.057	.008	
18,465	2.61	48,279.00						
2,069	2.50	5,173.00						
3,528	1.47	9,891.00		0	0	0	0	In place of granite.
4,340	2.74	16,197.00						
3,406		9,303.00						
3,340	1.99	8,942.00						
3,315	2.00	11,144.00						
10,400								
7,223	1.98½	22,140.00						
8,394	2.00	27,312.00						
1,785	.93	3,511.00						
6,926	3.30	22,855.00						
15,169	1.70	25,787.00						
3,653	1.87	6,925.00						
1,963	1.90	3,731.00	1882	1.36	.056		.076	
4,883	2.29	11,202.00			.043		.026	
3,610	3.00	11,202.00	1891	1.08	.008	.009	.062	
6,493	2.29	14,973.00			.036		.046	
2,063	1.98	5,227.00	1900		.074	0	0	
3,624	2.00	8,937.00			.021			
4,840								
2,969	2.00	7,342.00						
5,856	2.00	15,605.00						
8,600								
1,311	.96	1,781.00						

TABLE D.—*Descriptive list of street pavements and suburban roadways,*

Street.	From—	To—	Kind of pavement or roadway.
Eighth, NE	L	Florida avenue	Macadam
Eighth, SE	East Capitol	North Carolina avenue	Asphalt, H. B.
Do.	North Carolina avenue	Pennsylvania avenue	Asphalt
Do.	Pennsylvania avenue	K	Asphalt, H. B.
Do.	K	M	do
Do.	Intersection of M.		do
Eighth, SW	B	C	Asphalt
Do.	C	E	Asphalt, H. B.
Do.	E	H	do
Do.	H	Water	Gravel
Ninth, NW	B	Pennsylvania avenue	Granite
Do.	Pennsylvania avenue	F	Asphalt, H. B.
Do.	F	P	Coal tar
Ninth, NW (east side)	P	Rhode Island avenue	Asphalt, H. B.
Ninth, NW (west side)	P	Florida avenue	do
Ninth, NW (east side)	Rhode Island avenue	do	do
Ninth, NW	Florida avenue	Grant avenue	Macadam
Ninth NE	East Capitol	Massachusetts avenue	Asphalt, H. B.
Do.	Massachusetts avenue	Maryland avenue	Asphalt block
Do.	Maryland avenue	H	Asphalt
Do.	H	I	Gravel
Do.	G	Florida avenue	Macadam
Ninth, SE	East Capitol and Pennsylvania avenue	E and I	do
Do.	Pennsylvania avenue	E	Asphalt, H. B.
Do.	South Carolina avenue	Pennsylvania avenue	Asphalt block
Do.	I	K	Gravel
Do.	K	M	Macadam
Ninth, SW	B	C	Asphalt
Do.	C	Water	Granite
Tenth, NW	B	Pennsylvania avenue	do
Do.	D	E	Asphalt, H. B.
Do.	E	F	do
Do.	F	G	do
Do.	G	K	Coal tar
Do.	K	M	Asphalt, H. B.
Do.	M	O	do
Do.	O	R	do
Do.	R	S	Coal tar
Do.	S	T	Asphalt, H. B.
Do.	T	U	do
Do.	U	Florida avenue	do
Tenth, NE	East Capitol	C	Asphalt block
Do.	C	Maryland avenue	Gravel
Do.	Maryland avenue	G	Asphalt, H. B.
Do.	G	H	do
Do.	H	I	Gravel
Tenth, SE	East Capitol	D	Macadam
Do.	D	Pennsylvania avenue	Asphalt block
Do.	Pennsylvania avenue	I	do
Do.	do	I	do
Do.	K	M	Macadam
Tenth, SW	B	Maryland avenue	Asphalt block
Do.	D	Water	Cobble
Eleventh, NW	B	D	Asphalt, H. B.
Do.	D	E	do

repairs to asphalt pavements to July 1, 1901—Continued.

	Square yards.	Price per square yard.	Original cost.	Resurfaced.		Repairs—average annual cost per square yard.			Remarks
				Year.	Cost per square yard.	Prior to resurfacing.	Since resurfacing.	Current year.	
	1,500								
	2,508	\$1.68	\$6,299.00		0	0	0	0	
	4,785	1.93	10,493.00		0	0	0	0	4-inch base.
	9,182	1.92	17,630.00			\$0.081		\$0.117	
	2,929	2.33	6,825.00			.015		.035	
	480		1,071.00		0	0	0	0	In place of cobble.
	1,434	1.20	3,158.00			.006			On cobble base.
	3,085	2.25	7,800.00			.001		.008	
	3,573	1.68	7,459.00		0	0	0	0	
	1,900								
	2,290	1.91	4,316.00		0	0	0	0	
	3,381	2.26	9,004.00						In place of coal tar.
				1878	\$0.54		\$0.081		
				1884	.37				
				1885	.266				
	28,982	3.20	94,558.00	1886	.215				
				1887	.052		.024		
				1896	.43				
				1897	.088		.043	.005	
	1,563	2.28	3,683.00			.08		0	
	6,147	1.46	9,513.00			.007		0	
	3,371	2.30	7,759.00			.02		.026	
	3,500								
	1,217	2.00	4,035.00		0	0	0	0	4-inch base.
	6,712	2.00	21,589.00		0	0	0	0	
	5,781	2.00	17,962.00		0	0	0	0	
	2,190								
	2,300								
	6,073	.98	12,632.00						
	817	1.79	2,351.00		0	0	0	0	
	1,247	1.77	2,130.00						
	1,000								
	2,000								
	1,454	1.20	2,879.00			.003		0	Cobble base.
	7,081		22,859.00						
	3,103	3.20	9,927.00						
	2,487	1.75			0	0	0	0	Laid in 1885, widened
			12,256.00						1890; practically
					0	0	0	0	new pavement.
	2,000	1.75							Roadway widened,
									granite removed.
	955	1.74	1,775.00			.049		.009	
	4,828	3.00	14,913.00	1889	1.26	.014	.037		
	3,368	1.47	5,074.00	1891	.43		.016	.056	
							.017	.018	
	3,443	1.85	6,519.00				.009	.01	
	4,433	2.28	10,109.00				.043	.05	
	1,962	1.98	6,640.00	1901	1.00	.068		.041	
	1,948	2.25	6,344.00		0	0	0	0	
	2,588	1.68	6,075.00		0	0	0	0	
	4,683	1.80	12,291.00		0	0	0	0	
	4,208	1.77	10,972.00						
	2,670								
	2,915	1.93			0	0	0	0	
	2,061	2.00			0	0	0	0	4-inch base.
	2,190								
	4,748	.93	8,085.00						
	788	2.00	2,489.00						
	4,478	1.84	11,449.00						
	440	1.80	1,017.00						
	1,500								
	2,411	2.10	5,544.00						In place of cobble.
	2,589	.70	1,812.00						
	3,854	1.55	8,408.00		0	0	0	0	
	2,500	1.78	4,451.00	1891	1.736	.032	.012	0	

TABLE D.—*Descriptive list of street pavements and suburban roadways,*

Street.	From—	To—	Kind of pavement or roadway.
Eleventh, NW.	E	F	Granite
Do.	F	G	do
Do.	G	K	Coal tar
Do.	K	O	Granite
Do.	O	Florida avenue	Asphalt, H. B.
Eleventh, NE.	East Capitol	Massachusetts avenue	Asphalt block
Do.	Massachusetts avenue	C	do
Do.	C	Maryland avenue	Gravel
Do.	Maryland avenue	Florida avenue	Macadam
Eleventh, SE	East Capitol	C	Asphalt block
Do.	C	Pennsylvania avenue	do
Do.	Pennsylvania avenue	Eastern Branch	Granite
Eleventh, SE. (west side).	M	do	do
Eleventh, SW	B, south	Water	Belgian
Twelfth, NW	C	D	Asphalt, H. B.
Do.	Pennsylvania avenue	E	do
Do.	E	F	Granite
Do.	F	N	Coal tar
Do.	Intersection of G.		Asphalt, H. B.
Do.	N	O	do
Do.	O	Rhode Island avenue	do
Do.	Rhode Island avenue	Vermont avenue	Coal tar
Do.	R	S	do
Do.	S	V	Asphalt, B. B.
Do.	V	Florida avenue	Asphalt, H. B.
Twelfth, NE	Lincoln square northward.		do
Do.	Extension to 144 feet south of B.		do
Do.	C	Maryland avenue	Macadam
Do.	Maryland avenue	H	do
Do.	H	Florida avenue	do
Do.	Florida avenue	Mount Olivet road	do
Do.	Detroit	Bunker Hill road	Gravel
Twelfth, SE	East Capitol	Pennsylvania avenue	do
Twelfth, SW	Pennsylvania avenue to	Ohio avenue and B toriver.	Belgian
Do.	B, N	B, S	do
Thirteenth, NW	B	C	Asphalt, H. B.
Do.	C	Pennsylvania avenue	Coal tar
Do.	Pennsylvania avenue	E	Asphalt, H. B.
Do.	E	F	Granite
Do.	F	P	Coal tar
Do.	Around Iowa circle.		do
Do.	P	Corcoran	Asphalt, H. B.
Do.	Corcoran	T	do
Do.	T	Florida avenue	do
Do.	Florida avenue	Clifton	Macadam
Do.	Clifton	Whitney avenue	do
Do.	Whitney avenue	Spring road	Gravel
Thirteenth, NE	Emerson	Maryland avenue	Asphalt, B. B.
Thirteenth, SE	D	East Capitol	Gravel
Do.	D	Pennsylvania avenue	Macadam
Thirteenth, SW	B	Maryland avenue	Coal tar
Thirteen-and-a-half, NW.	do	E	Cobble
Thirteen-and-a-half, SW	do	D	Asphalt block
Fourteenth, NW	do	Pennsylvania avenue	Coal tar
Do.	Pennsylvania avenue	F	Granite

Repairs to asphalt pavements to July 1, 1901—Continued.

Square yards.	Price per square yard.	Original cost.	Resurfaced.		Repairs—average annual cost per square yard.			Remarks.
			Year.	Cost per square yard.	Prior to resurfacing.	Since resurfacing.	Current year.	
1,734	\$2.11	\$3,659.00						
1,214	1.89	2,321.00						
3,866	3.00	12,813.00	1898	\$0.59	\$0.045	\$0.067	\$0.044	
4,326	1.73	8,104.00						
8,734	2.25	37,118.00			.002		.0007	
1,003	1.84	2,500.00						
4,202	1.77	9,412.00						
2,300								
6,951	.68	5,642.00						
8,076	2.00	23,776.00						
7,006	2.00	19,523.00						
15,451	.91	53,724.00						
4,698	2.70	11,791.00						
10,511	3.45	36,393.00						
1,911	1.55	4,366.00		0	0	0	0	
1,202	1.78	2,316.00	1886	.946	.02	.008	.071	
1,627	2.11	3,434.00						
13,039	3.00	40,517.00	{ 1889	.117	.005	.04	.015	
198	2.04	407.00	{ 1894	.845		.023		
1,522	1.85	2,873.00		0	0	0	0	
1,859	2.27	4,240.00			.035		.017	
2,304	1.98	8,120.00			.048		.076	
1,798	2.00	8,177.00			.004		0	
5,377	2.00	18,873.00			.006		0	
3,554	2.25	12,542.00		0	0	0	0	
580	1.68	1,024.00		0	0	0	0	
1,737	1.76	3,830.00		0	0	0	0	
4,770								
4,374	.96	4,450.00						
3,543		6,188.00						
10,544	.91	10,817.00						
13,758	.20	7,353.00						
11,905	.59	6,979.00						
10,708	3.00	37,858.00						
8,187	3.50	28,655.00						
1,760	1.78	3,132.00	1893	1.321	.073	.105	.01	
3,037	3.00	9,803.00	1887	1.49	.018	.032	.01	
685	1.79	1,226.00			.057		.053	
1,741	2.11	3,708.00						
15,682	3.20	50,758.00	{ 1888	.28	.047			
			{ 1889	.381		.018	0	
8,838	3.20	28,382.00	1885	1.75	.009	.006	.008	
2,126	2.09	4,869.00			.037		.085	
4,273	2.25	10,558.00			.041		.105	
7,271	2.25	20,372.00		0	0	0	0	
2,700								
14,000								
5,800								
1,725	2.00	4,401.00		0	0	0	0	
11,013	.12	6,194.00						
2,638	.95	5,255.00						
5,706	3.60	17,117.00	1891	1.27	.021	.032	.002	
3,300								
3,016	1.84	6,635.00						
8,852	1.97	22,512.00	1894	.404	.049	.121	.021	
1,734	2.39	8,444.00						

East side laid by railway company.

TABLE D.—*Descriptive list of street pavements and suburban roadways.*

Street.	From—	To—	Kind of pavement or roadway.
Fourteenth, NW .....	F .....	New York avenue .....	Coal tar .....
Do .....	New York avenue .....	H .....	do .....
Fourteenth, NW. (east side) .....	H .....	Florida avenue .....	Asphalt, H. B. ....
Fourteenth, NW. (west side) .....	H .....	M .....	do .....
Do .....	M .....	Florida avenue .....	do .....
Fourteenth, NW. (east side) .....	Florida avenue .....	Clifton .....	do .....
Do .....	Clifton .....	Roanoke .....	do .....
Fourteenth, NW. (west side) .....	Florida avenue .....	Euclid .....	do .....
Fourteenth, NW .....	Yale, northward. Extension to Park.		do .....
Do .....			do .....
Fourteenth, NW. (east side) .....	Kenyon .....	Park .....	do .....
Fourteenth Street road .....	East Capitol .....	E .....	Gravel .....
Fourteenth, NE .....	Maryland avenue .....	E .....	Macadam .....
Do .....	East Capitol .....	Pennsylvania avenue .....	Gravel .....
Fourteenth, SE .....	B. north .....	B. south .....	Belgian .....
Fourteenth, SW .....	B. south .....	Alley south of B. ....	Asphalt, H. B. ....
Do .....	Alley south of B. ....	Maryland avenue .....	Granite .....
Fifteenth, NW .....	B .....	E .....	Asphalt .....
Do .....	E .....	Pennsylvania avenue .....	Asphalt, H. B. ....
Do .....	Pennsylvania avenue .....	New York avenue .....	do .....
Do .....	New York avenue .....	Vermont avenue .....	Coal tar .....
Do .....	I .....	K .....	do .....
Do .....	K .....	Rhode Island avenue .....	Asphalt, H. B. ....
Do .....	Rhode Island avenue .....	S .....	Coal tar .....
Do .....	S .....	U .....	Asphalt, H. B. ....
Do .....	U .....	V .....	do .....
Fifteenth, NE .....	East Capitol .....	E .....	Gravel .....
Fifteenth, SE .....	do .....	Pennsylvania avenue .....	do .....
Fifteen-and-a-half, NW. (Madison place) .....	Pennsylvania avenue .....	H .....	Coal tar .....
Sixteenth, NW .....	H .....	Scott square .....	Asphalt, H. B. ....
Do .....	Scott square .....	E .....	do .....
Do .....	R .....	156 feet south of Florida avenue .....	do .....
Do .....	156 feet south of Florida avenue .....	Morris .....	do .....
Do .....	Morris .....	Superior .....	Macadam .....
Do .....	Kenesaw .....	Park .....	do .....
Sixteen-and-a-half, NW. (Jackson place) .....	Pennsylvania avenue .....	H .....	Coal tar .....
Seventeenth, NW .....	B .....	E .....	do .....
Do .....	E .....	New York avenue .....	Asphalt, H. B. ....
Do .....	New York avenue .....	Pennsylvania avenue .....	Asphalt, H. B. ....
Do .....	Pennsylvania avenue .....	I .....	Coal tar .....
Do .....	I .....	Massachusetts avenue .....	do .....
Do .....	Massachusetts avenue .....	P .....	do .....
Do .....	P .....	Q .....	do .....
Do .....	Q .....	R .....	Asphalt, H. B. ....
Do .....	R .....	T .....	do .....
Do .....	T .....	Florida avenue .....	Gravel .....
Do .....	Grant .....	Lowell .....	Macadam .....
Eighteenth, NW .....	Virginia avenue .....	D .....	do .....
Do .....	E .....	New York avenue .....	Coal tar .....

pairs to asphalt pavements to July 1, 1901—Continued.

Square yards.	Price per square yard.	Original cost.	Resurfaced.		Repairs—average annual cost per square yard.			Remarks.
			Year.	Cost per square yard.	Prior to resurfacing.	Since resurfacing.	Current year.	
3,732	\$3.20	\$11,942.00	{ 1884	\$1.546	\$0.008	\$0.053	\$0.037	
1,549	3.20	4,957.00	{ 1885		.022	.023	.012	
29,085	1.97	60,212.00	{ 1891		.03	.064		
5,682	1.75	10,287.00	{ 1893		.841			
14,583	2.26	33,717.00	{ 1895	.022		.015	.003	
3,764	2.00		1894	1.09	.033	.037	.01	
879	1.77		1901	.618	.031		.021	
2,723	1.77			0	0	0	0	4-inch base.
3,725	2.25			0	0	0	.008	In place of 4-inch base.
4,307	2.25			0	0	.007	0	Do.
486	1.68			0	0	0	0	Widening.
6,600								
6,600								
3,000								
12,600								
7,841	3.50	27,443.00		0	0	0	0	In place of granite.
931	1.47	2,623.00						
5,653	1.40						.0016	On asphalt block.
5,252	1.03	7,643.00					.055	In place of asphalt block.
1,792							.004	8-inch base.
4,219	2.35	13,410.00			.042		.006	
7,005	3.20	22,416.00	1879	.967		.014	.006	
1,724	3.00	5,518.00	1891	1.39		.016	.005	North side McPherson square.
6,921	1.85	12,967.00			.018		.006	
7,516	3.00	22,548.00	{ 1887	.755	.012	.07	.003	
			{ 1891	.65		.007		
3,768	2.25	9,468.00			.0055		0	
1,486	1.68	3,669.00		0	0	0	0	
10,553	.59	5,721.00						
14,690	.499	9,328.00						
2,974	3.20	9,515.00	1880	.42	0	.031	0	
12,450	2.09	27,336.00			.018		.032	
10,818	2.26	25,026.00			.031		.034	
12,525					.055		.032	
7,194	1.76	17,408.00		0	0	0	0	
1,000								
4,700								
2,314	3.20	7,406.00	1880	.94		.011	0	
6,713	3.20	21,482.00			.036		.002	
2,573	2.18	6,222.00		0	0	0	0	
4,847					.021		.006	
4,958	3.20	15,866.00			.021		.006	
10,603	3.20	33,929.00	{ 1878	1.38		.021		
2,095	3.00	6,285.00	{ 1894	.84		.011	.001	
1,765	1.98	5,532.00	1894		.047	0	0	
1,874	2.00	6,154.00	1898	2.45	.037		0	
2,946	2.00	10,430.00			.021		0	
4,800								
1,100								
2,220								
1,095	3.20	3,506.00	1878	1.02		.024	.03	



pairs to asphalt pavements to July 1, 1901—Continued.

Square yards.	Price per square yard.	Original cost.	Resurfaced.		Repairs—average annual cost per square yard.			Remarks.
			Year.	Cost per square yard.	Prior to resurfacing.	Since resurfacing.	Current year.	
4,885	\$2.05	\$10,406.00	1880	\$1.15	\$.021	\$.024	0	In place of bituminous base.
4,515	3.20	14,448.00						
1,431	2.10	3,006.00						
7,584	3.20	24,269.00	{	1878 1.54		.018		
				1881 .486		.032		
				1895 .20		.100		
				1897 1.08		.018	.018	
1,764		4,600.00						
3,130	2.25	10,796.00		0	0	0		
3,623	2.25	12,333.00		0	0	0	0	Widening.
3,308	2.00	6,413.00			.021		.016	
4,408	1.53	9,514.00		0	0	0	0	
3,000	1.68							
3,154								
6,421	3.20	20,547.00	1878	1.50		.011	.028	
3,170	1.94	6,709.00						
3,723	2.38	8,915.00						
1,894	2.68	4,949.00						
2,409	2.06	5,198.00			.021		.086	Cobble base. Permit work.
7,598	3.20	24,314.00	{	1878 1.20		.01		
				1881		.027		
				1895		.016	0	
5,274				0	0	0	0	
1,086				0	0	0	0	
2,433								
5,579	3.20	17,863.00	{	1878 1.55		.019		
981	1.46	1,486.00		1899 1.43		.077	.152	
1,349	1.92	2,707.00			.022		0	
8,201	3.20	24,243.00	{	1880 .783	.015	.068		
				1884 .242				
				1894 .332		.064	.001	
2,167	3.20	6,934.00		1878 1.385		.063		
				1896 .284			0	
1,995	1.20	5,607.00		0	0	0	0	Cobble base. Permit work.
900	.70	630.00						
1,845	1.77							
1,460								
6,101	3.20	19,524.00	{	1878 1.57		.022		
				1899 1.57		.031	.097	
1,395	1.93	2,816.00						
10,822	3.20	34,864.00	1891	1.21	.019		.015	
956								
988	1.98	2,708.00			.052		.128	
1,433	2.00	5,190.00			.008		0	Cobble base.
3,572								
884	1.78	2,215.00		0	0	0	0	
1,406	1.20	3,532.00		0	0	0	0	
4,641	3.20	14,851.00	{	1884 .907	.02	.06	0	
				1900			0	
2,852	2.25	6,720.00			.015		.023	
3,894	2.00				.005		.006	
1,586	2.00	4,962.00			.014		.014	
2,668	1.94	6,453.00		0	0	0	0	4-inch base. Do.
2,128	1.94	4,500.00		0	0	0	0	
4,050								Cobble base. In place of asphalt block.
1,814	1.78	4,206.00		0	0	0	0	
3,642	.70	2,549.00						
1,425	1.20	3,347.00		0	0	0	0	
587	2.10	1,335.00						
1,800	1.77	4,309.00		0	0	0	0	

TABLE D.—*Descriptive list of street pavements and suburban roads*

Street.	From—	To—	Kind of pavement or roadway
Twenty-fourth, NW	G	Pennsylvania avenue	Cobble
Do	Pennsylvania avenue	M	Asphalt, H. B.
Do	Emporia	Frankfort	Macadam
Twenty-fifth, NW	H	K	Asphalt, H. B.
Do	K	Pennsylvania avenue	Asphalt, H. B.
Do	Pennsylvania avenue	M	do
Twenty-sixth, NW	G	K	Cobble
Do	K	Pennsylvania avenue	Granite
Do	Pennsylvania avenue	M	Coal tar
Twenty-seventh, NW	M	P	Macadam
Twenty-eighth, NW	M	Dunbarton	Asphalt
Do	Dunbarton	P	do
Do	P	Q	Asphalt, H. B.
Do	Q	U	Macadam
Twenty-ninth, NW	K	M	Cobble
Do	M	N	Granite
Do	N	P	Asphalt
Do	P	Q	Asphalt, H. B.
Do	Q	U	Macadam
Thirtieth, NW	Virginia avenue	K	Asphalt, H. B.
Do	K	Chesapeake and Ohio Canal	Cobble
Do	Chesapeake and Ohio Canal	M	Asphalt, H. B.
Do	M	N	Granite
Do	N	P	Asphalt, H. B.
Do	P	Q	Asphalt, H. B.
Do	Q	U	Granite
Thirty-first, NW	K	M	Coal tar
Do	M	N	Granite
Do	N	P	Asphalt
Do	P	U	Asphalt, H. B.
Do	P	U	Granite
Thirty-second, NW	K	M	Cobble
Do	M	P	Granite
Do	M	N	do
Do	P	Thirty-fourth	Cobble
Do	Thirty-fourth	Thirty-fifth	Macadam
Do	Thirty-fifth	Tunlaw road	Granite
Thirty-third, NW	K	M	Cobble
Do	M	N	Asphalt, H. B.
Do	N	P	Asphalt, H. B.
Do	P	Thirty-second	Asphalt, H. B.
Thirty-fourth	M	N	do
Do	N	P	do
Do	P	R	do
Do	R	Thirty-second	Macadam
Thirty-fifth	M	Prospect	Cobble
Do	Prospect	N	Asphalt, H. B.
Do	N	P	Coal tar
Do	P	Q	do
Do	Q	U	Asphalt, H. B.
Do	U	Tenallytown road	Asphalt, H. B.
Thirty-sixth	Prospect	O	Asphalt, H. B.
Do	O	P	Asphalt, H. B.

NOTE.—H. B.=hydraulic base; B. B.=bituminous base.

repairs to asphalt pavements to July 1, 1901—Continued.

r	Square yards.	Price per square yard.	Original cost.	Resurfaced.		Repairs—average annual cost per square yard.			Remarks.
				Year.	Cost per square yard.	Prior to resurfacing.	Since resurfacing.	Current year.	
	5,192	\$0.70	\$3,635.00		0	0	0	0	
	2,456	1.78	4,371.68		0	0	0	0	
	1,200				0	0	0	0	
	3,739	1.54	5,758.06		0	0	0	0	
	1,163	2.00	2,326.00		0	\$0.008	0	\$0.008	
	1,693	2.00	3,386.00		0	.006	0	.02	
	5,042	.70	3,529.40						
	1,690	2.48	4,211.20						
	919	2.67	2,454.00			.023		.022	
	4,100		5,887.00						
	2,879	1.10	3,166.90		0	0	0	0	{Cobble base. 4-inch base.
	1,551	1.96	3,040.96		0	0	0	0	
	1,474		3,737.00		0	0	0	0	
	2,350		1,080.00						
	2,919		4,727.00						
	1,885	2.46	4,637.10						
	2,906				0	0	0	0	On asphalt block.
	1,261	2.00	2,522.00		0	0	0	0	
	2,300								
	1,617	.70	1,132.00						
	1,116	1.76	1,964.16		0	0	0	0	
	2,121	2.15	4,560.15						
	2,952	2.23	6,582.96			.045		.064	
	1,232	2.00	2,464.00			.002		.002	
	2,746		10,204.00						
	1,209	1.98	2,393.82			.011		0	
	1,742	1.81	3,153.02						Do
	3,336		4,312.00						
	1,962	2.26	4,434.12						
	3,235								
	3,000								
	6,202	2.15	13,334.30						Widening.
	561		2,620.00						
	8,500								
	3,500								
	6,076		24,075.00						
	1,580	2.00	3,160.00		0	0	0	0	
	2,050	2.27	4,653.50			0.75		.068	
	4,675	2.00	9,350.00			.0008			
	1,660	2.00	3,320.00		0	0	0	0	
	2,109	2.00	4,218.00		0	0	0	0	
	2,284	2.00	4,568.00		0	0	0	0	
	6,570		8,984.00						
	850								
	1,017	2.00	2,034.00		0	0	0	0	
	2,939	1.97	5,799.83			.01		.003	
	1,558	1.97	3,069.26			.066		0	
	5,749	2.00	11,498.00	1901	\$1.86	.004		.032	
	6,009	2.25	13,520.25		0	0	0	0	
	2,368	2.00	4,736.00		0	0	0	0	
	707	1.78	1,258.46		0	0	0	0	

TABLE F.—Repairs to concrete and asphalt pavements for year ending June 30, 1901.

Street	From—	To—	New 6-inch hydraulic base.	Resurfacing.	Vitrified brick gutters.	Contract work.	Extra work.	Material.	Total cost.	Original pavement.	Year laid.	Original contractor.
Intersection La. avenue, 7th and C NW	17th	18th	Sq. yds. 2,702.16	Sq. yds. 1,964.90	Sq. yds. 383.07	\$6,068.98	\$315.52	\$703.19	\$7,287.60	Asphalt block	1880	McKnight & Burne.
H, NW	17th	18th			313.10	4,155.38		236.94	4,453.72	Asphalt	1884	Barber Asphalt Paving Co.
34th NW	B	Ya. ave.		5,327.94	650.97	10,793.22			11,496.33	do	1884	Do.
6th NW	N. Y. ave	Mass. ave		2,965.15	372.62	5,083.04		384.64	6,347.52	do	1890	J. S. Baldwin.
36th NW	P	2d		1,451.55	185.75	2,722.28		180.31	2,902.59	Coal tar	1887	Barber Asphalt Paving Co.
A, NE	4th	7th		3,226.68	555.25	6,108.56		529.07	6,637.63	do	1887	Do.
P, NW	17th	18th		3,320.82	433.53	6,553.56		391.50	6,945.06	Asphalt	1884	Do.
14th, NW	T	Fla. ave		4,964.76	396.53	8,723.77		392.00	9,115.83	do	1882	A. L. Barber.
(west side).										do	1885	Barber Asphalt Paving Co.
5th, NW	F	G	127.94	221.75	72.27	895.45	46.35	69.62	982.43	do	1885	Barber Asphalt Paving Co.
23d NW (widening).	L	M	1,429.14	441.75	390.40	4,015.59		233.45	4,399.04	Asphalt block	1886	P. Maloney.
G, NW, (widening)	5th	6th	312.91	590.34	132.19	2,251.42	22.67	153.77	2,427.86	Concrete	1872	Abbott Paving Co.
14th NW	Fla. ave.	Euclid	2,397.70		324.94	5,423.10	918.71	390.31	6,648.12	Asphalt, 4-inch base.	1889	Barber Asphalt Paving Co.
N, NW	21st	N. H. ave.		643.41	114.00	1,385.90	27.54	162.93	1,576.37	Concrete	1875	W. C. Murdock.
F, NE	N. Cap	Del. ave.		3,004.39	581.18	6,259.93	59.35	391.80	6,691.14	Asphalt, bituminous base.	1888	H. L. Cranford.
F, NE	Del. ave.	3d	4,281.62		611.37	8,690.64	76.13	645.58	7,413.35	do	1888	Do.
S, NW	9th	11th		2,782.74	421.08	5,297.00	86.48	420.46	5,743.94	Coal tar	1889	Do.
N, NW	16th	17th	1,564.34		227.81	3,852.45	163.65	436.87	4,452.97	Concrete	1873	C. E. Evans.
10th NW	R	S		1,022.81	157.03	1,895.58		165.51	1,991.09	Coal tar	1887	H. L. Cranford.
B, NW	Intersections 15th and 16th		2,090.92		130.74	5,340.04	630.32	283.97	6,254.33	Rubble	1874	John O. Evans.
Total			14,945.05	31,382.20	6,165.10	94,243.40	2,551.10	6,221.95	103,616.45			
Salaries and inspection									12,891.53			
Minor repairs:									119,507.98			
48,224.18 cubic feet asphalt surface laid, at 60 cents									28,934.50			
35,917.68 cubic feet asphalt border laid, at 31 cents									11,134.48			
44.20 cubic yards bituminous base, at \$3.									144.00			

pairs to asphalt pavements to July 1, 1901—Continued.

Square yards.	Price per square yard.	Original cost.	Resurfaced.		Repairs—average annual cost per square yard.			Remarks.
			Year.	Cost per square yard.	Prior to resurfacing.	Since resurfacing.	Current year.	
5,192	\$0.70	\$3,635.00						
2,456	1.78	6,418.00		0	0	0	0	
1,200								
3,739	1.54	9,129.00		0	0	0	0	
1,163	2.00	4,146.00		0	\$0.008	0	\$0.008	
1,693	2.00	5,972.00		0	.006	0	.02	
5,042	.70	3,529.00						
1,690	2.48	4,296.00						
919	2.67	2,454.00			.023		.022	
4,100		5,887.00						
2,879	1.10	11,290.00		0	0	0	0	{Cobble base. 4-inch base.
1,551	1.96			0	0	0	0	
1,474		3,737.00		0	0	0	0	
2,350		1,080.00						
2,919								
1,885	2.46	4,727.00						
{	2,966			0	0	0	0	On asphalt block.
	1,261	3,381.00		0	0	0	0	
	2,300							
1,617	.70	1,132.00						
1,116	1.76	2,651.00		0	0	0	0	
2,121	2.15	4,425.00						
2,932	2.23	7,961.00			.045		.054	
1,282	2.00	3,515.00			.002		.002	
2,746		10,204.00						
1,209	1.98	5,514.00			.011		0	Do
1,742	1.81	3,562.00						
3,398		4,312.00						
{	1,862							
	3,285							
3,000								
6,202	2.15	13,035.00						Widening.
561		2,620.00						
8,500								
3,500								
6,076		24,075.00						
1,580	2.00	5,800.00		0	0	0	0	
2,050	2.27	4,745.00			0.75		.088	
4,675	2.00	9,764.00			.0008			
1,690	2.00	4,958.00		0	0	0		
2,109	2.00	7,927.00		0	0	0	0	
2,264	2.00	8,494.00		0	0	0	0	
6,570		8,964.00						
850								
1,017	2.00	3,346.00		0	0	0	0	
2,929	1.97	8,164.00			.01		.003	
1,556	1.97	5,805.00	1901	\$1.86	.086		0	
5,749	2.00	18,593.00			.004		.032	
6,009	2.25	18,242.00		0		0	0	
2,368	2.00	7,994.00		0	0	0	0	
707	1.78	2,063.00		0	0	0	0	





Is and suburban streets for

work.				al cost	Name of contractor.
Old curb re- moved.	Straight curb reset.	Circular curb reset.	Straight curb set.	work.	
in. feet.	Lin. feet.	Lin. feet.	Lin. feet.		
				684.70	M. F. Talty.
				817.07	Do.
9.40	121.10		1,173.93	989.71	Barber Asphalt Paving Co.
				772.25	Geo. B. Mullen.
				412.00	M. F. Talty.
				662.82	Barber Asphalt Paving Co.
				349.34	M. F. Talty.
					Matthew Myers.
				264.13	J. C. Regan.
					Geo. B. Mullen.
40	3.90		189.90	552.12	Andrew Gleeson.
				201.06	Cranford Paving Co.
				971.66	R. A. Malone.
				326.06	Tait-Burrows Contracting Co.
	31.85		5,149	193.87	W. F. Brenizer.
				630.34	M. F. Talty.
					Lyons Brothers.
				485.71	M. F. Talty.
					Lyons Brothers.
				661.89	M. F. Talty.
				961.36	J. C. Regan.
					Barber Asphalt Paving Co.

1899.

\* Cubic

ing roadways under per

				5,190.94	Washington Asphalt Block and Tile Co.
				698.77	Do.
				619.05	Do.
				476.04	Barber Asphalt Paving Co.

1. The first part of the document is a list of names and dates, which appears to be a record of some kind. The names are written in a cursive script, and the dates are in a more formal, printed style. The list is organized into two columns, with names on the left and dates on the right.

2. The second part of the document is a short paragraph of text, written in a cursive script. It appears to be a continuation of the record or a separate entry. The text is somewhat difficult to read due to the cursive style and the quality of the scan.

3.—Repairs to concrete and asphalt pavements at cost of railroad companies.

Location.	Street.	From—	To—	Amount.
d Sub-	B, NE	First	Third	\$2.73
	North Capitol and K, NW			4.20
	North Capitol and New York avenue			3.64
	Sixth and Pennsylvania avenue			4.24
	Massachusetts avenue and G, NW			3.64
	G, NW	Second	Fourth	2.73
	North Capitol	I	K	4.55
	Sixth and G, NW			.91
				26.64
				2.73
tia and ac River.	Second and H, SW			53.76
	O, NW	Fourth	Eleventh	3.19
	First and Maryland avenue, SW			1.36
	Second, SW	C	Virginia avenue	2.73
	Third and T, NE			23.66
	Fourth and H and Fourth and Massachusetts avenue			2.73
	Fourteenth, NW	Pennsylvania avenue	B	
				90.16
litan	Tenth and F, NW			4.55
	Connecticut avenue, E		S	.60
	Fifteenth and H, NW			4.55
	Ninth and Pennsylvania avenue, NW			1.82
	Ninth and H, NW			1.82
	Thirty-sixth and O, NW			1.82
	B, NE	First	Second	3.66
	Four and a-half	Missouri avenue	Maryland avenue	10.01
	Ninth and M, NW			.91
	Connecticut avenue	K	Dupont circle	1.82
	Ninth	New York avenue	Massachusetts ave nue.	15.16
	Fourteenth	F	New York avenue	2.73
	D, NW	New Jersey avenue	First	2.73
	Second and East Capitol			.91
				53.09
on and s' Home.	Sixth and Pennsylvania avenue, NW			1.82
raction	Pennsylvania ave- nue, NW.	Thirteenth	Fourteenth	3.64
	do	Fourteenth	Fifteenth	3.64
	do	Fifteenth	Twenty-fourth	16.84
	do	Tenth	Thirteenth	1.36
	do	Twenty-fourth	Twenty-sixth	10.01
	Pennsylvania avenue, SE., intersection Fifth			.91
	Twenty-sixth	Pennsylvania avenue	M	7.28
	Fourteenth and Rhode Island avenue			3.00
	Thirty-first and M			1.36
	M	Bridge	Thirty-first	18.20
a				66.24
	H, NE	North Capitol	Fifteenth	53.73
	H, NW	Third	Fourth	22.29
	Massachusetts ave- nue.	Fourth	Seventh	24.11
	New York avenue	Tenth	Fifteenth	12.74
	Thirteenth and New York avenue			4.10
				115.57

H.—Work done by day labor under the appropriation for "Current repairs to streets, avenues, and alleys," from July 1, 1900, to June 30, 1901.

sidewalk laid	square yards	2,438
sidewalk relaid	do	17,196
block paved	do	731
block repaved	do	578
brick repaved	do	811
block paved	do	549
block repaved	do	604
paved	do	10,523
t	linear feet	573
set	do	3,037
aid	do	3,827
block relaid	square yards	1,701
tile sidewalk relaid	do	1,008
sidewalk	do	531
ing	cubic yards	7,562
	square yard	10,165
		\$24,734.71
		1,667.32

TABLE I.

No.	Location.	For whom done.	Grad- ing.	Cement side- walk.	Cur- b.
			<i>Cu. yds.</i>	<i>Sq. yds.</i>	<i>Lins.</i>
2001	2121 Massachusetts avenue NW.....	Carl F. Grieshaber.....		342.12	
2002	Adams Mill road to east line Capital Traction Company.	T. J. Fisher & Co.....	52	761.02	
2003	North side Whitney avenue NW., be- tween Holmead avenue and Four- teenth street.				
2003	West side Holmead avenue, between Lydecker and Whitney avenues.	W. F. Mattingly.....	1,277		
2003	South side Lydecker avenue, between Fourteenth street and Holmead ave- nue.				
2004	Eighteenth street NW., rear 1533 New Hampshire avenue.	Ralph L. Galt.....		43.68	
2005	1400 Fourteenth street NW.....	F. W. Huddleson.....		75.49	
2006	214, 216 B street SE.....	Theo. J. Mayer.....		47.97	
2007	220 B street SE.....	H. C. McCauley.....		47.21	
2008	1906 Cincinnati street NW.....	J. M. Kenyon.....		18.18	
2009	30 Patterson street.....	F. Keffner.....		9.56	
2010	Connecticut avenue and Cincinnati street, intersection.	Thos. E. Waggaman.....			
2011	306 C street NW.....	Helen McIlvaine.....		27.37	
2012	Thirteenth street, corner Hartford, Brookland.	James F. McHugh.....	170	103.40	
2013	218 B street SE.....	Theo. J. Mayer.....		35.23	
2014	1449 Huntington place.....	Mrs. M. L. Pryor.....		17.34	
2015	South side V street NW., from First street.	W. J. Palmer.....			
2016	Quincy, Richmond, Seventh streets and New Hampshire avenue.	B. H. Warner & Co..	38	572.76	
2019	South side O street NE., from North Capitol street, east.	E. B. Moore.....		455.66	
2020	1629 Twenty-first street NW.....	J. J. Byrne.....		187.95	
2021	510 I street NW.....	P. M. Dubant.....		5.94	
2022	1416 and 1418 Twenty-first street NW.	C. E. Compton.....		45.94	
2023	Lots 104 to 108, inclusive, square 609...	Geo. W. Montgomery.....		98.40	
2024	1414 Twenty-first street NW.....	C. E. Compton.....		23.20	
2025	Sixth street NW., between Florida avenue and T street.	J. F. Allison.....		27.12	
2026	2548 University place.....	Wm. E. Boulter.....		29.12	
2027	Corner Third and N streets SE.....	John T. Webster.....		88.13	
2028	473, 475, 477, and 479 E street SW.....	B. Leonard.....		65.62	
2029	1211 S street NW.....	F. Schafherst.....		20.69	
2030	312, 314 Thirteenth street NW.....	A. G. Yount.....		30.08	
2031	306 to 314, inclusive, N street SE.....	John T. Webster.....		74.66	
2032	Grace street, between Potomac and Thirty-second streets NW.	Capital Traction Co.		169.55	
2033	213, 215, 217, and 219 Wilson street.....	B. H. Warner.....			
2034	122 to 154, inclusive, Thomas street.....	Collins & Gaddis.....			
2035	Corner Pierce and North Capitol streets (Sibley Hospital).	A. H. Ames.....		54.94	
2036	West side Kentucky avenue SE., between Fourteenth and E streets.	American Security and Trust Co.	121		
2037	2332 to 2338 Massachusetts avenue NW.	Chas. W. King.....			
2038	Twelve and a half street NE., between B and C streets.	S. Carr.....			
2039	1733 R street NW.....	Thos. E. Waggaman.....	45		
2040	Alley, square 1010, between B and C, Twelfth and Thirteenth streets NE.	S. Carr.....	80		
2041	1542 Fifteenth street NW.....	M. H. Pilling.....		39.40	
2042	East side Sixteenth street NE., between East Capitol and A streets.	H. G. Wagner.....			
2043	Lots 181 to 186, Lanier Heights.....	B. H. Warner & Co..			
2044	South side V street NW., to North Capitol street.	W. J. Palmer.....			
2045	457 and 459 H street SW.....	H. B. Lansdale.....		30.55	



TABLE L.—Rep

No.	Location.	For whom done.	Grad- ing.	Cement side- walk.	Cur- b.
			<i>Cu. yds.</i>	<i>Sq. yds.</i>	<i>Lin.</i>
2046	Alley, square 289, F and G, Twelfth and Thirteenth streets NW.	American Security and Trust Co.	14		
2047	Lots 5 and 6, block 15, Woodridge	C. W. Brown			
2048	Corner Thirty-fifth and R streets NW.	Ed. Schneider		118.83	
2049	Massachusetts avenue and Twenty-second street NW.	Paul J. Peltz		330.68	
2050	314 C street NW	Louis Kimmel		26.36	
2051	1210 D street NW	D. A. Sanford		79.29	
2052	Woodley road and Idaho street.	J. N. McGill			
2053	1611 Twenty-ninth street NW	D. L. Wilson		45.02	
2054	1026, 1028 Eighth street NW	Emmons S. Smith		39.71	
2055	Northwest corner Seventh and D streets NW.	Jas. G. Hill		223.71	
2056	1707 I street NW	Chas. W. Holmes		39.90	
2057	Rear 921 Pennsylvania avenue (D street NW).	B. H. Warner & Co.		34.28	
2058	North Capitol and E streets NW.	W. H. Cissel & Son			
2059	1233 Twelfth street NW	Fred. B. Pyle		23.01	
2061	Corner Sixteen-and-a-half and N streets NW.	Chas. A. Langley		190.40	
2063	1522 Twelfth street NW	Mrs. Wm. Linn		17.12	
2064	West side Thirty-sixth street NW, from O street north.	John J. Horigan		128.10	
2066	1317, 1319 Massachusetts avenue NW	Mrs. Woodbury		60	
2067	1100, 1111 G street NW	Jas. F. Scaggs		79.49	
2068	Northeast corner Tenth and G streets NW.	Danl. Frazier		168.07	
2069	1321 Massachusetts avenue	Mrs. E. L. Wallan		31.80	
2070	North side N street from Ninth to Tenth street.	Wm. Henry		83.97	
2071	2135 R street NW	T. F. Jewell		28.97	
2072	Southwest corner Eighth and D streets NW.	John S. Larcombe		74.81	
2073	South side Kenesaw avenue and Thirteenth street.	James E. Smith		106.97	
2074	Southwest corner Seventh and M streets NW.	A. B. Clark		116.97	
2075	Corner Fifteenth and R streets NW. (St. Paul's Church).	A. Brown		144.76	
2077	1447 Huntington place NW	Hannah Pettitt		13.94	
2078	1207 Rhode Island avenue NW	Mrs. A. C. Porter		27.58	
2079	734 Fifteenth street NW	T. B. Ferguson		100.33	
2080	Fifteenth street, between V and W streets NW. (St. Paul's Church).	Jas. F. Markin		179.48	
2081	West side Sixth street SW., between E and F streets.	T. Moran		303.79	
2083	1503 Pennsylvania avenue NW	Cranford Paving Co.			
2084	414, 416, 418 Eighth street NW	E. Burgdorf	5		
2085	1412, 1414 F street NW	Cranford Paving Co.			
2087	Southeast corner Ninth and I streets SE.	S. Carr	51		
2088	1524 K street NW	Dr. H. Krogstad		8.81	
2089	Alley, block 7, Washington Heights	Geo. S. Cooper	304		
2090	Northwest corner Fourteenth and C streets SE.	L. N. Saunders	1.50		
2091	Northwest corner Fourteenth street and Pennsylvania avenue (Willard's Hotel).	Fred Drew			
2092	412 Fifth street NW	Geo. E. Hamilton			
2093	Thirteenth street, between N and O streets (Iowa Apartment House).	A. H. McLaughlin		150.26	
2094	East side Champlain avenue, north of Florida avenue.	Margt. A. O. Srier	2		
2095	1140 Fifteenth street NW	American Security and Trust Co.		20.09	
2096	1326, 1328 Nineteenth street NW	R. D. Jewett	2		

**continued.**

[illegible]

TABLE I.—Regular

No.	Location.	For whom done.	Grading.	Cement sidewalk.	Curb reset.
			<i>Cu. yds.</i>	<i>Sq. yds.</i>	<i>Lin. ft.</i>
2097	129 Indiana avenue NW .....	W. H. Wills .....		24.21	20.00
2098	1471, 1473, 1475 Park street .....	Chas. W. King .....		30.56	
2099	49 I street NW .....	T. A. Rober .....		59.40	48
2100	Eighth street NW., between D and E streets.	S. Dana Lincoln .....		90.15	
2101	First street NW., between Bates and P streets.	Thos. L. Rishiehl .....		61.60	51.20
2102	Southwest corner Thirteenth and E streets (Southern Rwy Co.).	R. B. Pegram .....		282.85	89.20
2103	1696 and 1698 Thirty-first street .....	John Leitch .....		41.61	64
2104	C street NW., between Thirteen-and-a-half and Fourteenth streets.	C. C. Willard .....			137
2105	East side School street, north to Park street.	A. B. Jamison .....		200.57	
2106	Evarts place NW., between Twenty-seventh street and Connecticut avenue.	H. P. Waggaman .....			
2107	221, 223, and 225 Pennsylvania avenue SE.	Theo. J. Mayer .....		87.09	75
2108	705 and 707 K street NW .....	Wm. Schwing .....		6.83	
2109	East side Buckingham place, west of Twentieth street.	H. P. Waggaman .....			
2110	West side Twenty-fourth street, Langdon, between Emporia and Frankfort streets.	J. J. Baker .....		217.17	
2111	1505 Rhode Island avenue NW .....	Geo. W. Baird .....		26.77	
2112	Southwest corner Fourteenth street and New York avenue NW.	Davidson & Davidson .....	8		
2113	935 Fourth street NW .....	Chas. H. Goeckler .....		18.20	
2115	310 C street NW .....	D. A. Sanford .....		50.24	51.60
2116	Northwest corner Twenty-first and Q streets NW.	D. C. Phillips .....		230.41	
2118	Tenth street NW., front of the "First Colored Society of New Jerusalem."	Rev. Jas. E. Thomas .....		40.38	
2119	U street NW., between First and Second streets.	Emma M. Gordon .....		97.63	
2120	West side Fourteenth street NW., south of Binney street.	F. E. Altemus .....		31.53	
2121	South side Cincinnati street, block 3, Cliffbourne.	Waddy B. Wood .....		69.55	
2122	South side Seaton street NW., between First and Second streets.	John M. Henderson .....		193.89	
2123	1647 Thirtieth street NW .....	Rebecca Alexander .....			
2124	1410 Fifteenth street NW .....	H. Morrell .....		1.38	
2125	2100 E street NW .....	J. B. Lawler .....		65.66	
2126	Lots 2 and 3, block 4, Twining City .....	Geo. J. T. Maise .....			
2127	1923 I street NW .....	M. F. Finley .....		45.76	
2128	1515 First street NW .....	J. B. Linton .....			
2129	1622 Twenty-first street NW .....	R. C. Parker .....		26.14	24.50
2130	Southeast corner North Capitol and G streets.	V. B. Johnson .....			10
2132	1318 and 1320 Twelfth street NW .....	Thos. Jarvis .....		7.33	
2133	Southeast corner First and Bates streets NW.	C. A. Read .....		18.83	5
2135	B street SE., between Second and Third streets (Church of Reformation).	Rev. W. E. Parsons .....		51.30	
2136	First and K streets NE .....	Union Trust and Storage Co. ....		123.84	
2137	310 K street NW .....	Louisa Goeckler .....		28.09	28.80
2138	312 K street NW .....	C. J. Goeckler .....		33.12	28.90
2139	312 Indiana avenue NW .....	W. H. Wills .....		28.02	33.30
2146	209 Seventh street SW .....	Nixon Brewer .....	8		
	Total .....		2,178.50	8,840.40	3,421.04

ermut—Continued.

Curb set.			Vitri- fied block paved.	As- phalt block paved.	Cob- ble.	Flag laid.	Flag relaid.	Brick side- walk paved.	Brick side- walk re- paved.	Con- crete base laid.	Gran- ite blocks re- paved.	Cost.
6 by 20 inches.	8 by 8 inches.	Old.										
Lin. ft.	Lin. ft.	Lin. ft.	Sq. yds.	Sq. yds.	Sq. yds.	Lin. ft.	Lin. ft.	Sq. yds.	Sq. yds.	Cu. yds.	Sq. yds.	
50	3	4.40										\$31.94
												93.25
												75.70
												100.80
												120.54
	35.70											383.90
					20		60					58.28
												30.06
37.47												538.66
	1,165.41											1,057.98
												113.42
74.60		10										12.19
		377.45										888.61
												369.59
	20											51.28
	273.10											370.87
		18.35										24.40
	237											64.53
												524.27
												44.73
												108.15
												34.92
												79.14
240.63												498.06
			11						10			22.14
73.12												2.46
115					16			90				158.00
												59.32
	28.75											54.27
												50.07
		9										37.10
			13.50						4			27.25
	14.98											13.08
	58.57											38.19
												121.63
	103.48											243.47
4.71												43.46
												43.49
												37.37
			30						9	30		63.13
2,761.59	7,371.43	550	414.50	100	68.83	2,003.6	60	1,016	206	30	1.50	24,360.13

TABLE K.—

No.	Location.	Grading.	Cement side- walk.	Curb reset.	Curb set.		
					6 by 20 inches.	8 by 8 inches.	Old.
		<i>Cu. yds.</i>	<i>Sq. yds.</i>	<i>Lin. ft.</i>	<i>Lin. ft.</i>	<i>Lin. ft.</i>	<i>Lin. ft.</i>
3001	Alley, square 733, between First and Second, C and D streets SE.	254		74			
3002	Eighth street SE., from E to G street (both sides).....					528.85	
3003	West side Harewood avenue NW., between Florida avenue and T street.....					263.21	
3005	South side I street SE., between Twelfth and Georgia avenue.....		290.99		269.60		
3006	E street SE., from Sixth to Seventh street (both sides).....			31.60	1,247.80		6.30
3007	West side Second street SE., from north curb line of C street north.		121.83	111			
3008	West side Second street SE., from D to North Carolina avenue.....		246.41	19	215.30		
3009	North Carolina avenue SE., from First to Second street.....		963.03				
3010	South side L street SE., from Seventh street to 25-foot alley east.		180.46				
3011	West side Fifteenth street SE., from A to B street.....		249.31				
3012	South side A street SE., from Fourteenth to Fifteenth street.		323.40				
3013	North side A street and Massachusetts avenue SE., from Thirteenth to Fourteenth street.....		543.51				
3014	East side Thirteenth street NE., between North Carolina avenue and B street.....		516.48				5
3015	Alley, square 670, between New York avenue, O, North Capital, and First streets NE.....	350					
3016	Alleys in block 27, Isherwood.....						
3017	Alley in square east of No. 1042.....	104		108			
3018	West side Twenty-second street NW., from R street north.....		142.00	35.75	120.10		
3019	Alley, square 1005.....	830		30			
3020	West side Vermont avenue NW., between L street and Thomas circle.....		234.56	218.20			11.40
3021	West side Seventeenth street NW., from Grant to Lowell street.....		269.43				6
3023	Wilson street, from Linden street (41) eastward.....						
3041	North side E street NE., from Third to Fourth street.....		446.03				
3042	West side Fourteenth street NW., from Welling place to Euclid place.....		359.89				
3043	North side Florida avenue NW., between Le Droit and Harewood avenue.....		521.14	15		537.20	
3044	East side Fifth street NE., from E to F street.....		438.43	15.14	406.80		
3047	Joliet street, between Connecticut avenue and Zoological Park (both sides).....				492.10		7.80
3048	Joliet street, between Connecticut avenue and Zoological Park (both sides).....		519.31				
3050	North side M street NW., from Twelfth to Thirteenth street.....		420.67				
3051	South side P street NE., from North Capitol street to 15-foot alley east.....		462.84				
3052	West side Eighth street, from Quincy north; west side Eighth street, from Quincy south; east side Ninth, from Quincy street to 15-foot alley; east side Ninth, from Quincy street north; both sides Quincy street, from Eighth to Ninth streets.....	80	1,015.57		1,579.11		



TABLE K.—Asphalt

No.	Location.	Grading.	Cement side- walk.	Curb reset.	Curb set.		
					6 by 20 inches.	8 by 8 inches.	Old
		<i>Cu. yds.</i>	<i>Sq. yds.</i>	<i>Lin. ft.</i>	<i>Lin. ft.</i>	<i>Lin. ft.</i>	<i>Lin. ft.</i>
3053	North side R street NW., be- tween Fourteenth and Fif- teenth streets.....		593.94				
3054	East side Tennessee avenue, be- tween East Capitol and B streets.	25	317.17				
3055	Both sides Vernon avenue NW., between Florida avenue and Nineteenth street.....		1,673.54				
	Both sides California avenue NW., between Florida avenue and Nineteenth street.....		1,095.41				
3056	South side Kenesaw avenue, west from Fourteenth street.....	9	118.95		136.85		
3057	South side Massachusetts ave- nue and I street NW, from Fourth to Fifth street.....		1,000.64	661.70			84
3058	Both sides North Capitol street from Michigan avenue south				4,082.70		
3059	Concord street, from Tenth to Thirteenth street.....	101	1,430.43		2,212.83		
3060	Newport place, from Twenty- first to Twenty-second street.		754.32				
3061	Tenth street NE., between I and K streets (east side).....		177.48			21.40	
3062	West side Nineteenth street, from Baltimore to Cincinnati street.....		303.85				
3064	East side Twelfth street NE., from Rhode Island avenue south.....	52	285.37				
3065	South side Kenyon street, from Thirteenth to Fourteenth street.....	107.60	606.75				
3066	North side Q street, from Six- teenth to Seventeenth street...		327.90	300			13
3067	Alleys in square 1058.....	1,443		125.58	9.42		
3068	Northeast corner Nineteenth and Q streets NW.....		280.92	36	138.49		233.8
3069	North side W street, from Four- teenth to Florida avenue.....		644.38	8.81			
3070	South side U street, from Seven- teenth street to New Hampshire avenue.....		484.10	4.10		33.20	
3071	North side K street NE., from Eleventh to Twelfth street		401.57		316.80		32
3072	East side Third street, Le Droit Park, Elm to Spruce street		113.43			127.53	
3073	Both sides Callan street NE., from Sixth to Seventh street.....		739.81	14	1,257.00		
3074	South side Hanover street, be- tween North Capitol and First street.....		100.24		139.72		
3075	West side First street NW., from Q to Florida avenue.....		369.74			349.02	
3077	North side Q street, between Florida avenue and First street.		650.85	20.35		552.30	
3078	North side Florida avenue NW., from Fifth to Sixth street.....		434.63	489			56
3079	Both sides Nineteenth street ex- tended, from Florida avenue to Columbia road.....		2,434.91			2,176.37	
3080	South side S street NW., from North Capitol to First street...		826.83	746.33	9.42		125
3081	North side Kenesaw street NW., from Thirteenth to Fourteenth street.....	106.57	911.22				71
3082	Both sides Columbia street NW., from Thirteenth to Fourteenth street.....		1,696.42	18			8
3083	Both sides L street NE., from Seventh to Eighth street.....		690.70	25			
3084	South side Hartford street, be- tween Twelfth and Thirteenth street.....		367.13				



TABLE K.—AsseSSment

No.	Location.	Grading.	Cement side- walk.	Curb reset.	Curb set.		
					6 by 20 inches.	8 by 8 inches.	Old
		Cu. yds.	Sq. yds.	Lin. ft.	Lin. ft.	Lin. ft.	Lin.
3087	East side First street NW., from H to I.		359.88	33.80	18.84		80
3088	Both sides Twentieth street, be- tween Woodley road and south property line, Cliffbourne.	800	1,351.08			1,576.40	
3089	West side Seventh street NE. from Galena to Hartford, and east side Seventh street, Hart- ford to Keokuk.	490	826.62				
3091	West side M street NW., from Thirty-fourth to Thirty-fifth street.		456.65	12			12
3092	South side Virginia avenue NW., from Twenty-fourth street to G street.		476.50		3.64		20
3094	West side Twenty-ninth street NW., from Q street north.		108.66				
3095	South side Dartmouth street NW., from Thirteenth eastward.		402.59		575.05	31.42	
3096	North side N street, from Ninth to Tenth street NW.		500.81			476.84	4
3097	North side Madison street NW., between Seventeenth and Eighteenth streets.		267.52				
3098	East side Third street, Le Droit Park, from Florida avenue north to T.		688.50	70		682.17	
3099	North side Park street NW., Mount Pleasant, S. P. Brown's subdivision.				152.65		
3100	East side Brightwood avenue, south side Chesapeake street, and west side Illinois avenue, block 3, Brightwood Park.		376.93	9	53.80		
3102	East side Thirty-sixth street NW., from O to P street.		308.40				
3101	North and south sides Baltimore street NW., front block 3, Cliff- bourne.		1,435.51			1,304.38	
3103	West side Fourteenth street NW., from Columbia road south.		189.28				
3105	Alley, square 744 (Francis plan).				17.51		
3106	North side Dartmouth street NW., from Thirteenth eastward.		372.01	50	508.25	26.51	
3107	North side T street NW., from Ver- mont avenue to Eleventh street.		254.43	119			
3108	Alleys, square 640.						
3109	South side E street NE., from Third to Fourth.		441.78				
3111	Alley, square 933, between Ninth and Tenth, H and I, NE.						
3112	West side Fourteenth street SE., from East Capitol to A.		239.71				
3113	East side First street SE., from B to C street.		558.65	485.40		70	
3116	South side G street NW., Twen- tieth to Twenty-first street.		406.07	382.50		25	
3117	Both sides First street NW., from Rhode Island avenue to V street.		819.38				
3118	North side Wyoming avenue, be- tween Eighteenth and Nine- teenth; south side Wyoming avenue, between Eighteenth and Nineteenth; south side Wy- oming avenue, between Nine- teenth and Columbia road; north side California avenue, between Eighteenth and Nine- teenth; south side California avenue, between Eighteenth and Nineteenth; both sides Ver- non street, between Eight- eenth and Nineteenth streets.					837.02	

—Continued.

Bed ck ed.	Asphalt block paved.	Cobble.	Asphalt tile re- laid.	Flag laid.	Flag relaid.	Brick sidewalk laid.	Brick sidewalk relaid.	Granite block laid.	Cost.
<i>sq. ft.</i>	<i>Sq. yds.</i>	<i>Sq. yds.</i>	<i>Sq. yds.</i>	<i>Lin. ft.</i>	<i>Lin. ft.</i>	<i>Sq. yds.</i>	<i>Sq. yds.</i>	<i>Sq. yds.</i>	
									\$476.23
									3,292.13
									1,228.63
									538.96
									499.68
									122.42
									1,022.62
									1,068.96
									285.06
									1,774.44
						52.50			228.64
									465.53
									347.27
									3,568.15
									192.89
574								1,383	1,804.75
									929.84
	27.50								297.93
									56.86
									454.18
583									930.58
									246.93
									708.97
									530.97
									790.00
									840.96

TABLE K.—Assessment

No.	Location.	Grading.	Cement side- walk.	Curb reset.	Curb set.		
					6 by 20 inches.	8 by 8 inches.	Old.
		<i>Cu. yds.</i>	<i>Sq. yds.</i>	<i>Lin. ft.</i>	<i>Lin. ft.</i>	<i>Lin. ft.</i>	<i>Lin. ft.</i>
3119	Both sides E street SE., from Sixth to Seventh street		1,382.66				
3120	Both sides G street, from Sixth to Seventh, Ninth to Tenth, Fourteenth to Fifteenth					2,484.40	
3121	Alley, square 224, between Eighth and Ninth, C and D streets	1,845		36		9.32	
3122	North side O street west to Twenty-first street, and east side Twenty-first from O north		285.15	259.40	9.43		45.62
3123	South side East Capitol street, from Third to Fourth street		515.83	340			40
3125	North side Garfield avenue, from South Capitol to E street	400			249.22		
3126	West side Twenty-first street NW., Virginia avenue to E street		207.71				
3127	South side Binney street NW., from Fourteenth street west to 30-foot alley	31				690	
3128	Alleys in square 965, between Tenth and Eleventh, B and Massachusetts avenue	1,350		30			
3129	Alleys in square 248, between K and L, Thirteenth and Fourteenth streets	834					
3130	Alleys in square 988, between Eleventh and Twelfth, East Capitol and B NE	493		76	9.42		
3131	Alleys in square 280, running from Twelfth street	102					
3132	South side Grant street, from Sixteenth to Seventeenth street	25	121.47	153.10			3.05
3133	South side R street NW., from Thirty-second to Thirty-third street		247.78	29			
3134	West side Fifth street NW., D to E		500.24	7.10		302.07	
3137	West side Fifth street NW., F to G					285.30	
3138	West side Second street SE., from B to Carroll			30		263.28	
3140	South side Dartmouth street NW., from Thirteenth east						
3141	West side Thirteenth street NW., from Hanover to Whitney avenue		959.03				27.40
3142	South side Kenyon street NW., from Thirteenth street east, and south side Marshall, from west line Todd & Brown's subdivision		417.39			99.61	
3143	Alley, north half square 672	856			35.42		
3145	Alley, square north of 990	43		35.00			
3147	Alley, north half square 744, between Francis place, N, First, and Second	321					
3148	Alleys, south half square 69	48		18			
3149	Alleys, square 44	817					
3150	Alleys, square 923	1,168		95	9.42		
3151	Alleys, square 24	2,065					
3152	Both sides Third street SW., from B to Virginia avenue					2,432.02	
3153	Both sides Ninth street SE., from East Capitol to A		849.22				
3154	North side Providence street, from Fourteenth to Fifteenth, Brookland						
3155	Alley, square 368, between M and N, Ninth and Tenth streets	230		15			
3157	North side Pennsylvania avenue and B street SE., from Second to Third	217.47				312.47	
3158	South side Massachusetts avenue NW., Sixth to Seventh, and west side Sixth street NW., Massachusetts avenue south		863.77	580	63.10		

## 67

**work—Continued.**

[illegible]

TABLE K.—Assessment

No.	Location.	Grading.	Cement side- walk.	Curb reset.	Curb set.		
					6 by 20 inches.	8 by 8 inches.	Old.
		<i>Cu. yds.</i>	<i>Sq. yds.</i>	<i>Lin. ft.</i>	<i>Lin. ft.</i>	<i>Lin. ft.</i>	<i>Lin. ft.</i>
3161	West side Harewood avenue, from Elm to Oak street.....		150.82	16.00	174.96		
3163	East side New Jersey avenue NW., D to E street.....		613.95	379.00	52.74		
3164	East side First street SE., from N south to alley.....	109		8.00	203.00		
3165	South side S street NW., from First to Second.....	348		19.00	522.59		
3166	North side G street NW., from Ninth to Tenth.....		479.46				
3167	South side G street NW., from Fifth to Sixth.....		288.04	5.00			
3168	East side Twenty-fourth street NW., L to M streets.....		512.82				
3169	North side E street NE., Second to Third.....		447.57				
3170	North side R street NW., Florida avenue to Twenty-second street.		216.79	184.40			
3171	Both sides Oak street, Third to Fourth street.....		437.15		769.77		30.38
3172	North side Yale street NW., be- tween Thirteenth and Sherman avenue.....		267.45				
3174	Alley, Adams Mill road, between Columbia road and Lanier ave- nue.....	164					
3175	Both sides California avenue NW., Nineteenth to Florida avenue.....			36.84		1,768.60	
3176	Both sides Vermont avenue NW., Nineteenth to Florida avenue.....			34.00		1,109.85	
3177	South side G street NE., from Fourteenth to Florence.....	16		20	208		
3178	Alleys in square 677.....	750		1.95	56.62		
3179	West side Second street SE., from N street southward.....	225		180.10			
3180	Both sides A street NE., from Fourth to Seventh.....					2,409.63	
3181	Both sides Twenty-third street NW., from L to M.....					1,080.57	
3182	Both sides P street NW., from Seventeenth to Eighteenth.....					1,695.36	
3183	Both sides R street NW., between Thirty-third and Thirty-fourth.		779.94				
3184	Alley, square 66, between Q and R, Florida avenue and Twenty- first.....	445		30	9.42		
3185	West side Fourteenth street NW., T to W streets.....					1,177.72	
3187	South side Erie street, from Champlain avenue to Ontario avenue, and west side Ontario avenue, from Erie street south- ward.....	160	499.68				
3188	Both sides Fourth street NE., from D to E street.....		992.37				
3190	West side School street, from Park to Grant street.....		356.87		447.69		
3192	Alleys in block 3, Cliffbourne.....	1,876					
3194	Alleys in square 103.....	450		15			
3195	Alleys in square 1002.....	647		36			
3196	West side Fourteenth street SE., from C to South Carolina ave- nue.....	245		15	468.58		
3197	South side Lincoln street NW., Sixth to Brightwood avenue.....	208					
3198	Alley (part of) in square 1283.....	8					
3201	South side I street SW., from Half to First street.....	207					
3203	North side M street NW., between Thirty-fifth and Thirty-sixth streets.....		246.85	10.70			6.30
3204	West side Twelfth street NW., from New York avenue to I street.....		158.50	126.60			27



TABLE K.—Assessment

No.	Location.	Grading.	Cement side- walk.	Curb reset.	Curb set.		
					6 by 20 inches.	8 by 8 inches.	Old.
		Cu. yds.	Sq. yds.	Lin. ft.	Lin. ft.	Lin. ft.	Lin. ft.
3206	North side H street SW., from Half to First street.....	128					
3211	North side D street NW., Eighth to 10-foot alley east.....		207.89	4.90		150.26	
3212	West side Ninth street NE., from K to Florida avenue.....		600.26				
3213	East side Thirteenth street NE., from D to E street.....		527.72		442.60		
3214	Nos. 314, 316, 318 Eighth street NW.		68.09	3.60		55.13	
3215	West side First street NW., from N to O streets.....		490.34				
3216	Nos. 432, 434 Eighth street NW.		127.46	3.80		91.55	
3217	North side P street NW., from Fifteenth to Sixteenth.....		465.38			530.27	
3218	Nos. 400, 402, 404 Eighth street NW.		129.27	4.60		86.10	
3219	Alley, square 574.....	120		30			
3220	Nos. 1618 to 1626, inclusive, Four- teenth street NW.....		179.54			107.11	
3222	Fifteenth street NW., lot 141, square 195, and north side Rhode Island avenue, Fifteenth to Six- teenth.....		743.68	21.70		505.20	
3224	North side Pennsylvania avenue NW., from Jackson place west- ward.....		355.81	2.70		259.35	
3225	North side R street NW., from Thirty-second to Thirty-third.....		229.62	8			9.42
3227	Alley, square 245 (east portion).....	60		18			
3228	Both sides A street NE., from Fourth to Seventh streets.....		2,230.83				
3229	East side Third street NE., from H street north.....		208.14	9.00		173.60	16.40
3230	Alley, block 7, Commissioners sub- division, Washington Heights.....	35					
3242	Alleys, square 1283.....	1,087		68	28.20		
3253	Alleys, east half block 41, Colum- bian College lands.....	158					
3262	Alleys, south half of square 620.....	208					
3271	Ninth street SE., from Virginia avenue to Georgia avenue.....		21			335.05	
3274	South side Georgia avenue SE., Ninth to Eleventh street.....	165				613.17	
3276	North side Virginia avenue SE., Ninth to Tenth street.....	56				323.50	
3278	Alley (north half), square 150.....	416		65	18.84		
3283	Aley, square 231, adjacent to lots 10 and 11.....	103					
3285	Alleys, square 151, lying north of Willard street.....	230					
3290	North side W street NW., be- tween First and Second streets.....	150		138	221.42		
3291	West side Flagler place, between U and north line lot 1, block 32.....	20					
3299	East side Tennessee avenue NE., between East Capitol and B streets.....		308.60				
3300	Both sides Ninth street SE., be- tween East Capitol and A streets.....			96		703.05	9.42
3301	South side Seaton street NW., be- tween First and Second streets.....		220.41		323.91		
3303	Alleys in square 225, between Fourteenth, Fifteenth, Penn- sylvania avenue and F streets.....						
3305	East side First street NW., be- tween P and Bates.....		147.09	48		113.37	
3307	South side C street NW., from Arthur Place to New Jersey avenue.....		230.93				
Total.....		24,451.64	58,336.09	7,610.75	18,288.69	23,755.73	928.79

work—Continued.

Vitrified block paved.	Asphalt block paved.	Cobble.	Asphalt tile re- laid.	Flag laid.	Flag relaid.	Brick sidewalk laid.	Brick sidewalk relaid.	Granite block laid.	Cost.
Sq. yds.	Sq. yds.	Sq. yds.	Sq. yds.	Lin. ft.	Lin. ft.	Sq. yds.	Sq. yds.	Sq. yds.	
						405			\$259.44
									407.73
									680.68
									1,287.74
									136.77
									547.14
									249.02
									1,107.99
	403					12			240.61
									719.85
									320.73
									1,345.91
									687.72
	29			12			3		257.49
									577.14
									2,532.67
111									423.44
808							22		198.45
									1,683.32
	367								640.09
309	2								653.35
									376.25
									845.72
									365.75
655						8			1,236.83
									30.68
									83.70
						312			530.58
						192			87.38
									441.55
									801.06
									639.00
									451.89
									292.70
									255.81
12,195.07	13,677.50	41.00		177		3,019.70	164.00	13.93	179,421.61

TABLE L.—*Replacing and repairing sidewalks and c*

No.	Location.	Grading.	Cement sidewalk.	Curb set.
		<i>Cu. yds.</i>	<i>Sq. yds.</i>	<i>Lins.</i>
8001	North Carolina avenue, in front of reservation 229		150.78	
8007	Thirteenth street, Vermont avenue, O street, and Iowa Circle		444.67	31
8011	Seaton Park, from Missouri avenue to Maine avenue		375.01	21
8014	Reservation 100, Twenty-fourth street, F, Virginia avenue NW		346.46	
8015	Reservations 98 and 134, New Hampshire avenue, Virginia avenue, and G street		759.68	
8018	Reservation 102, Virginia avenue, Twenty-second and E streets NW		285.61	11
8017	Reservation 99, G and Twenty-fourth streets NW		295.00	21
8019	South side Pennsylvania avenue SE., between Seventh and Eighth streets		280.31	21
8020	D street NE., between Ninth and Thirteenth streets			
8028	Hubbard School, Kenyon street NW., between Sherman avenue and Thirteenth street		201.41	
8029	East side Tennessee avenue, between East Capitol and B streets NE	20.00	208.52	
8040	Truck house, S street NW., between Thirty-fourth and Thirty-fifth streets	121.00		6
8074	East side Fourteenth street NW., between I and K		568.66	
8169	New Jersey avenue, between D and E streets NW. (police station)		89.15	40
	Total	141.00	4,001.24	1,070

and public reservations and municipal buildings.

Curb set.			Brick sidewalk repaved.	Granite block.	Cobble.	Flag re- laid.	Asphalt tile.	Cost.
4 by 20 inches.	8 by 8 inches.	Old.						
Lin. ft.	Lin. ft.	Lin. ft.	Sq. yds.	Sq. yds.	Sq. yds.	Lin. ft.	Sq. yds.	
								\$146.73
24.50		70.00						536.47
36.20		31.00						527.25
								334.38
	1,078.97							1,921.14
227.60								512.42
12.10		20.00						349.59
	20.55	20.00						405.40
			822.00	24.00	28.00	80.00		197.91
	124.87							324.02
								207.04
72.25								461.62
	385.10							1,011.88
								104.71
372.65	1,609.49	141.00	822.00	24.00	28.00	80.00		7,040.56

TABLE M.—Miscellaneous

No.	Location.	Appropriation.	Grading.	Curb rest.
			<i>Cu. yds.</i>	<i>Lis. f</i>
8002	Rock Creek Park.....	Grading streets, alleys, and roads.		
8003	Quarry road bridge.....	Bridge across Rock Creek line Quarry road.		
8004	Rock Creek Park.....	Care and improvement of Rock Creek Park under board of con- trol.		
8005	Newport place.....	Grading streets, alleys, and roads.		
8012	Florida avenue, at Tenth street NW.	Improvements and repairs, northwest section.		
8024	Bennings road.....	Grading streets, alleys, and roads.	6,195	
8025	G street, between Sixth and Fif- teenth streets.	G street, between Sixth and Fif- teenth streets NW.		
8027	O street, between North Capitol and First streets NE.	Improvements and repairs, northeast section.		
8028	Massachusetts avenue bridge.....	Massachusetts avenue bridge across Rock Creek.		
8031	Eighth street NE., between L and Florida avenue.	Improvements and repairs, north- east section.		
8032	K street SE., between South Cap- itol and Second streets.	Improvements and repairs, south- east section.		
8033	Second street SE., between I and L streets.	do.....		
8034	H street SW., between First and Canal streets.	Improvements and repairs, south- west section.		
8035	Half street, between H and N streets SE.	Improvements and repairs, south- east section.		
8036	I street SW., between First and Canal streets.	Improvements and repairs, south- west section.		
8037	L street, between South Capitol and Second streets SE.	Improvements and repairs, south- east section.		
8038	Half street, between G and N streets SW.	Improvements and repairs, south- west section.		
8039	Ninth street NE., between I street and Florida avenue.	Improvements and repairs, north- east section.		
8042	Bennings road, east of the bridge.	Grading streets, alleys, and roads.	6,257	
8043	Connecticut avenue crossing, Ca- thedral avenue.	Cathedral avenue.....		
8044	Blagden avenue.....	Grading and regulating Blagden avenue.		
8045	L street SE., east from Fifteenth street.			
8047	Bennings road, east of bridge.....	Bennings road.....		
8048	Michigan avenue.....	Michigan avenue.....		
8049	Thirty-seventh street, between Y and Back streets.	Thirty-seventh street.....		
8051	D street NW., between Eighteenth and Twentieth streets.	Improvements and repairs, north- west section.		
8052	Eighteenth street NW., between D street and Virginia avenue.	do.....		
8053	Nineteenth street NW., between E street and Virginia avenue.	do.....		
8054	New York avenue NW., between Nineteenth and Twenty-third streets.	do.....		
8055	Twentieth street NW., between E street and Virginia avenue.	do.....		
8056	Twenty-first street NW., between E street and Virginia avenue.	do.....		
8057	Twenty-second street NW., be- tween Virginia and New York avenues.	do.....		
8058	Michigan avenue, west of Lincoln avenue.	Michigan avenue.....		
8059	Frankfort street, between Twen- tieth street and Queens Chapel road.	Frankfort, Twenty-second, and Twenty-fourth streets, Lang- don.		
8060	Acker street, between Sixth and Seventh streets NE.	Improvements and repairs, north- east section.		

work.

Curb set.		Cobble.	Brick sidewalk paved.	Brick sidewalk repaved.	Cobble gutters.	Drain-pipe.	Cost.
6 by 20 inches.	Old.						
Lin. ft.	Lin. ft.	Sq. yds.	Sq. yds.	Sq. yds.	Sq. yds.	Lin. ft.	
							\$601.50
							151.00
							12,430.54
							126.87
							77.44
							1,495.62
							345.66
							44.15
							12.50
							91.00
							535.10
							73.70
							113.15
							485.69
							119.95
							528.39
							620.21
							255.12
							1,729.92
							440.32
							243.19
							329.00
							902.19
							62.31
							190.63
							176.02
							222.80
		81					606.99
							224.40
							159.50
							303.92
							38.73
							156.87
							82.00

TABLE M.—Miscellaneous

No.	Location.	Appropriation.	Grading.	Curb rest.
			Cu. yds.	Lin. ft.
8061	Thirty-seventh, intersection of W street.	Thirty-seventh and other streets, Burleigh.	2,300	
8062	V street NW., between North Capitol and First streets.	Grading streets, alleys, and roads.	2,080	
8064	Third street, between L and M streets NE.	Improvements and repairs, north-east section.	1,259	
8065	Intersection Crescent and Sixteenth street extended.	Grading and improving Crescent street.		
8066	Bennings road, east of bridge.	Bennings and Anacostia roads.		
8067	Frankfort street, between Twenty-second and Twenty-fourth streets.	Frankfort street, between Twenty-second and Twenty-fourth streets, Langdon.		
8068	Acker street, between Sixth and Seventh streets NE.	Improvements and repairs, north-east section.	59	
8071	Twenty-third street NW., between Virginia avenue and E street.	Improvements and repairs, north-west section.		
8072	Columbus avenue.	Grading streets, alleys, and roads.		
8073	U street, between Thirty-sixth and Thirty-seventh streets, and Thirty-sixth street, between U and V streets.	Thirty-seventh and other streets, Burleigh.		
8075	Florida avenue, from New York avenue to Brentwood road.	Retain of J. Frawly.	150	10
8076	D street, between Ninth and Thirteenth streets NE.	Improvements and repairs, northeast section.		
8078	South Capitol street, K to M streets SW.	Improvements and repairs, southwest section.		
8080	Quincy street, between Eighth street and Brightwood avenue.	Quincy street.		
8081	Fourth street, between D and F streets NE.	Improvements and repairs, northeast section.		
8082	Kenesaw avenue.	Kenesaw avenue and Park road.		
8084	Philadelphia street.	Emergency.	1,125	
8086	Twelfth street NE., between Emporia and Austin streets.	Grading streets, alleys, and roads.	2,310	
8087	Kenesaw avenue.	Kenesaw avenue and Park road.		
8090	Thirteenth street NE., between C and Emerson streets.	Grading streets, alleys, and roads.	1,118	
8091	Crescent street.	Crescent street.		
8092	C street, between Fourteenth and Fifteenth streets SE.	Grading streets, alleys, and roads.		
8093	Second street, between I and K streets SE.	Improvements and repairs, southeast section.	2,350	
8095	K street, between Ninth and Tenth streets NE.	Grading streets, alleys, and roads.	1,800	
8096	do.	Rebuilding Lovejoy School building.		
8098	Cathedral avenue, between Cincinnati street and Woodley lane.	Cathedral avenue.		
8100	Cathedral avenue.	do.		
8102	Twenty-second street NW., between D street and New York avenue.	Improvements and repairs, northwest section.		
8103	E street, between Twentieth and Twenty-first streets NW.	do.		
8105	Bennings road, east of Eastern Branch.	Bennings road.		
8107	Genesee street, between Brightwood avenue and Fourteenth Street road.	Grading streets, alleys, and roads.		
8108	Cathedral avenue, intersection of Woodley road.	Cathedral avenue.	50	35
8110	Connecticut avenue, north of Cleveland Park.	Connecticut avenue extended.		
8112	Rock Creek Park.	Grading streets, alleys, and roads.		
8113	Bennings road, east of bridge.	Bennings and Anacostia roads.		

k-Continued.

Curb set.		Cobble.	Brick side- walk paved.	Brick sidewalk repaved.	Cobble gutters.	Drain- pipe.	Cost.
by 20 ches.	Old.						
in. ft.	Lin. ft.	Sq. yds.	Sq. yds.	Sq. yds.	Sq. yds.	Lin. ft.	
							\$398.57
							281.25
							323.98
							108.24
						165	28.84
							701.58
			957				77.90
							64.70
							318.00
							960.00
		40					35.30
							71.96
				198			42.87
							78.09
							60.70
							63.12
							190.26
							181.81
							693.38
							218.94
							43.09
							62.87
							294.19
							830.81
							124.56
							79.86
							787.09
							41.59
							23.41
		384					315.18
							853.37
		98					78.62
							241.60
							448.75
							210.79

TABLE M.—Miscellaneous

No.	Location.	Appropriation.	Grading.	Curb reset.
			<i>Cu. yds.</i>	<i>Lin. ft.</i>
8116	North side Pennsylvania avenue SE., between Eleventh and Thirteenth streets.	Improvements and repairs, southeast section.	180	—
8117	Fortieth and Xenia streets (chemical engine house).	Chemical engine house, Tennallytown.	18	82
8120	Ninth street SE., between Pennsylvania avenue and E street, and Pennsylvania avenue SE., between Eleventh and Thirteenth streets.	Improvements and repairs southeast section.	—	—
8121	Thirteenth street NE., from C to D streets.	Grading streets, alleys, and roads.	—	—
8122	Whitney avenue, near Fourteenth street NW.	Truck house, Columbia Heights.	—	—
8123	Quarry road bridge.	Quarry road bridge.	—	—
8124	Fifteenth and K streets SE.	Grading streets, alleys, and roads.	—	—
8131	Bennings and Anacostia roads.	Bennings and Anacostia roads.	—	—
8132	Thirty-seventh street, between Y and Back streets.	Streets in Burleigh.	—	—
8134	Fifteenth and Rosedale streets (Webb School).	One 8-room school building and site.	—	—
8139	Quarry road bridge.	Quarry road bridge.	—	—
8141	V street NW, and other streets.	Streets in Burleigh.	—	—
8159	Rock Creek Park.	Roadway from Brightwood avenue across Rock Creek Park.	—	—
8160	Eleventh street, between Wallace and Whitney avenues.	Eleventh street extended.	—	—
8161	Blagden avenue.	Blagden avenue.	—	—
8162	Michigan avenue.	Michigan avenue.	61	—
8163	Tennallytown road (chemical engine house).	Chemical engine house, Tennallytown.	—	—
8165	East side Rock Creek, between Cincinnati street and Woodley road.	Cincinnati street retaining wall.	—	—
8166	Adams Mill road, from Cincinnati street to Zoo entrance.	Adams Mill road.	—	—
8167	Fifth street NE., between D and E streets.	Improvements and repairs, northeast section.	—	—
8168	Bladensburg road.	Bladensburg road.	—	—
	Total.		27,312	417

—Continued.

Curb set.		Cobble.	Brick side- walk paved.	Brick sidewalk repaved.	Cobble gutters.	Drain- pipe.	Cost.
y 20 hea.	Old.						
Lin. ft. 96.69	Lin. ft. 975	Sq. yds.	Sq. yds.	Sq. yds.	Sq. yds.	Lin. ft.	
							\$359.23
		54					307.65
				802			191.85
							34.75
							68.04
							162.25
							307.50
							881.28
					350		122.50
							1,639.46
							181.98
							199.50
							618.99
							186.50
						308	405.48
		67					124.08
							100.27
							301.18
							243.07
							11.50
						300	113.25
96.69	975	724	967	1,000	515	608	39,763.64

TABLE N.—Whole cost of work.

No.	Location.	For whom done.	Cement sidewalk laid.	Curb re-set.	Brick sidewalk laid.	Vitrified block laid.	Cost.
			Sq. yards.	Lin. feet.	Sq. yards.	Sq. yards.	
5001	S street NW., between Phelps place and Twenty-fourth street.	Davidson & Davidson	130.75	28.25			\$10.00
5002	No. 2121 Massachusetts avenue NW	C. F. Greishaber					140.80
5004	Anacostia Bridge	Anacostia and Potomac Rwy. Co.					21.16
5005	South Capitol, between N and O streets.	Anderson & Howison				16.86	41.01
5006	No. 1306 Fourteenth street NW	Geo. W. Lyles					3.15
5007	Nos. 1046-1012 Thirteenth street NW	Dewey Hotel Co.					93.53
5008	First and E streets NW	Jas. Holmes & Son		16.5	6.75		5.00
5009	No. 1246 Third street SW	H. L. Rust					2.35
5010	Fourteenth and Pennsylvania avenue NW	Bernard Green		197.9			73.80
5011	No. 1325 Fourteenth street NW	L. Leaman					6.00
5013	No. 3157 Q street NW	Joe Richardson		24.8		14.4	46.28
5014	No. 1000 Maryland avenue NE	J. T. Moxley					5.00
5015	No. 1117 Eighteenth street NW	T. E. Weggaman		9	15	9	7.00
5016	University place, opposite	Mrs. J. H. Merrillat					19.87
	Total		130.75	271.45	21.75	40.06	475.06

TABLE O.—Number of square yards and cost charged for repairs to cuts made by plumbers and others in streets, avenues, and alleys during the year ended June 30, 1901.

Item No. 1 shows the number of cuts repaired for various plumbers.  
 Item No. 2 shows the number of cuts repaired and the cost thereof, or "whole-cost" work, to which 5 per cent is added for tools, clerk hire, etc., for the maintenance of the "Deposit and assessment fund," which fund is used to pay all accounts for labor, material, tools, etc., used in class of work, and also includes the work done for gas, electric-light, and telephone companies, which is charged at the flat rates charged to plumbers.  
 Item No. 3 shows the number of cuts repaired on account of the sewer department and the cost of the same.  
 Item No. 4 shows the number of cuts repaired on account of the water department and the cost of the same.  
 Item No. 5 shows the number of cuts repaired and work done on account of other appropriations of the District and the cost of the same; also the cost of work charged against retents and appropriations of the General Government.

	Number.	Square yards.	Cost (amount charged).
No. 1.—Plumbers' cuts:			
Sheet asphalt .....	198	507.2	\$1,597.68
Granite block .....	137	506.16	683.32
Asphalt block .....	264	660.5	891.67
Vitrified block or brick .....	112	504	680.40
Cobblestone and rubble .....	236	511	229.95
Macadam .....	92	151.91	81.05
Granolithic .....	87	174	391.50
No. 2.—Anacostia and Potomac River R. R., City and Suburban R. R., Metropolitan R. R., Capital Traction Co., Brightwood R. R., United States and Potomac Electric Light Co., Washington Gas Light Co., and other corporations.....	1,126	3,014.77	4,555.57
No. 3.—Various appropriations of the sewer department.....	984	30,122.5	20,412.22
No. 4.—Pumping expenses and pipe distribution, water department .....	451	16,265.4	14,592.83
No. 5.—Various appropriations of the District other than the above, including repairs to streets and roads, street lighting, telegraph and telephone service, improvements and repairs, assessment and permit work, etc.....	369	15,104.6	11,728.90
	141	4,651.1	8,972.34
Total .....			60,261.86

The following statement is a comparison between the plumbers' cuts made during year ended June 30, 1901, and for the eleven preceding years. These figures include all small repair work (charged at flat rates) done for corporations prior to fiscal year 1900. Work of this character is now included under item No. 2.

Year.	Number.	Square yards.	Cost.	Year.	Number.	Square yards.	Cost.
90 .....	306	2,085.06	\$3,712.00	1895-96 .....	1,305	11,941.03	\$14,156.18
91 .....	852	3,899.61	6,488.02	1896-97 .....	1,016	15,048.07	25,539.55
92 .....	980	5,220.5	6,894.58	1897-98 .....	1,659	7,022.37	11,718.27
93 .....	2,132	8,094.67	14,025.68	1898-99 .....	1,524	6,728.05	10,316.83
94 .....	1,583	9,233.25	15,272.72	1899-1900 .....	1,436	3,916	4,686.58
95 .....	1,236	6,718.57	9,267.71	1900-1901 .....	1,126	3,014.77	4,555.57

TABLE N.—Whole cost of work.

No.	Location.	For whom done.	Cement sidewalk laid.	Curb re-set.	Brick sidewalk laid.	Vitrified block laid.	Cost.
			Sq. yards.	Lin. feet.	Sq. yards.	Sq. yards.	
5001	S street NW., between Phelps place and Twenty-fourth street.	Davidson & Davidson.	130.75	28.25			\$10.00
5002	No. 2121 Massachusetts avenue NW.	C. F. Greishaber.					140.80
5004	Anacostia Bridge.	Anacostia and Potomac Rwy. Co.					21.16
5006	South Capitol, between N and O streets.	Anderson & Howison				16.66	41.01
5008	No. 1306 Fourteenth street NW.	Geo. W. Lyles					3.15
5007	Nos. 1008-1012 Thirteenth street NW.	Dewey Hotel Co.					93.53
5008	First and E streets NW.	Jas. Holmes & Son		16.5	6.75		5.00
5009	No. 1208 Third street SW.	H. L. Rust.					2.86
5010	Fourteenth and Pennsylvania avenue NW.	Bernard Green		197.9			73.80
5011	No. 1325 Fourteenth street NW.	L. Leaman					6.00
5013	No. 3157 Q street NW.	Jos. Richardson		24.8		14.4	46.28
5014	No. 100 Maryland avenue NE.	J. T. Moxley					5.00
5015	No. 1117 Eighteenth street NW.	T. E. Wagaman		9	15	9	7.00
5016	University place, opposite	Mrs. J. H. Merrilat.					19.87
	Total		130.75	271.45	21.75	40.06	\$75.06

**TABLE O.**—*Number of square yards and cost charged for repairs to cuts made by plumbers and others in streets, avenues, and alleys during the year ended June 30, 1901.*

Item No. 1 shows the number of cuts repaired for various plumbers.  
 Item No. 2 shows the number of cuts repaired and the cost thereof, or "whole-cost" work, to which 5 per cent is added for tools, clerk hire, etc., for the maintenance of the "Deposit and assessment fund," which fund is used to pay all accounts for labor, material, tools, etc., used in this class of work, and also includes the work done for gas, electric-light, and telephone companies, which is charged at the flat rates charged to plumbers.  
 Item No. 3 shows the number of cuts repaired on account of the sewer department and the cost of the same.  
 Item No. 4 shows the number of cuts repaired on account of the water department and the cost of the same.  
 Item No. 5 shows the number of cuts repaired and work done on account of other appropriations of the District and the cost of the same; also the cost of work charged against retents and appropriations of the General Government.

	Number.	Square yards.	Cost (amount charged).
<b>ITEM NO. 1.—Plumbers' cuts:</b>			
Sheet asphalt .....	198	507.2	\$1,507.68
Granite block .....	137	506.16	683.32
Asphalt block .....	264	660.5	891.67
Vitrified block or brick .....	112	504	680.40
Cobblestone and rubble .....	236	511	229.95
Macadam .....	92	151.91	81.05
Granolithic .....	87	174	391.50
	1,126	3,014.77	4,555.57
<b>ITEM NO. 2.—Anacostia and Potomac River R. R., City and Suburban R. R., Metropolitan R. R., Capital Traction Co., Brightwood R. R., United States and Potomac Electric Light Co., Washington Gas Light Co., and other corporations .....</b>	984	30,122.5	30,412.22
<b>ITEM NO. 3.—Various appropriations of the sewer department ..</b>	451	16,265.4	14,592.83
<b>ITEM NO. 4.—Pumping expenses and pipe distribution, water department .....</b>	369	15,104.6	11,728.90
<b>ITEM NO. 5.—Various appropriations of the District other than the above, including repairs to streets and roads, street lighting, telegraph and telephone service, improvements and repairs, assessment and permit work, etc .....</b>	141	4,651.1	8,972.34
<b>Total .....</b>			60,261.86

The following statement is a comparison between the plumbers' cuts made during the year ended June 30, 1901, and for the eleven preceding years. These figures include all small repair work (charged at flat rates) done for corporations prior to the fiscal year 1900. Work of this character is now included under item No. 2.

Year.	Number.	Square yards.	Cost.	Year.	Number.	Square yards.	Cost.
1889-90 .....	303	2,085.06	\$3,712.06	1895-96 .....	1,305	11,941.03	\$14,159.18
1890-91 .....	852	3,809.61	6,488.02	1896-97 .....	1,016	15,048.07	25,539.55
1891-92 .....	980	5,230.5	6,994.58	1897-98 .....	1,659	7,022.37	11,718.27
1892-93 .....	2,132	8,694.67	14,025.68	1898-99 .....	1,524	6,728.05	10,316.83
1893-94 .....	1,583	9,233.25	15,272.72	1899-1900 .....	1,436	3,916	4,686.58
1894-95 .....	1,236	6,718.57	9,267.71	1900-1901 .....	1,126	3,014.77	4,555.57

LIST OF EMPLOYEES OF SURFACE DIVISION, OTHER THAN DAY LABORERS, ENGAGED ON REGULAR AND CONTINUOUS WORK, WHOSE SERVICES WILL BE REQUIRED DURING THE FISCAL YEAR 1903.

	Rate of wages.	Estimated amount of salary for the year.
1 assistant engineer .....	<i>Per day.</i> \$4.85	\$1,528
Do .....	4.00	1,232
1 engineer of bridges .....	125.00	1,500
1 transitman .....	3.50	1,086
3 rodmen .....	3.00	2,817
3 chainmen .....	2.25	2,112
1 draftsman .....	3.50	1,065
2 clerks .....	4.50	2,836
1 clerk .....	4.00	1,232
Do .....	3.00	939
1 inspector .....	5.00	1,555
Do .....	4.00	1,232
1 computer .....	4.00	1,232
1 messenger .....	1.75	568
1 superintendent of stables .....	5.00	1,609

<sup>1</sup> Per month.

<sup>2</sup> Four months; paid for balance of year from sewer and water appropriations.

List of employees, surface division, temporarily required, and appropriation from which paid, for fiscal year ended June 30, 1901.

Designation.	Number.	Assessment and permit work.	Improvements and repairs.	Repairs to county roads.	Side-walks and curbs around public reservations.	Constructing county roads.	School-houses.	Engines and truck houses.
Assistant engineers...	4	\$1,329.19	\$1,594.39	\$257.81	\$120.82	\$587.10	-----	-----
Inspectors .....	28	3,876.00	3,638.00	270.00	75.00	1,334.00	\$84.00	\$91.00
Foremen .....	18	3,102.97	813.13	4,737.87	-----	808.79	137.59	40.65
Other employees .....	580	26,063.20	9,009.15	34,548.61	199.18	9,623.98	920.89	279.41
Total .....	-----	34,370.36	15,054.67	39,814.29	395.00	12,413.87	1,142.48	380.46

Designation.	Bridges.	Repairs to streets, etc.	Deposit and assessment fund.	Rock Creek Park.	Grading streets, alleys, and roads.	Various deposits.	Emergency repairs to roads and bridges.	Grand total.
Assistant engineers...	\$522.10	\$1,582.89	-----	-----	-----	-----	-----	\$5,994.30
Inspectors .....	3,963.00	3,406.50	-----	-----	-----	\$822.00	-----	17,588.50
Foremen .....	976.04	3,845.10	\$1,377.36	\$1,691.68	-----	10.10	\$309.05	17,910.33
Other employees .....	8,924.77	26,417.59	12,410.73	11,859.73	\$6,388.71	67.61	2,160.62	148,673.58
Total .....	14,385.91	35,312.08	13,788.09	13,551.41	6,388.71	809.71	2,469.67	190,306.71

## REPORT OF THE SUPERINTENDENT OF COUNTY ROADS.

WASHINGTON, July 1, 1901.

SIR: I have the honor to submit report of the operations of the county road division during the fiscal year ended June 30, 1901.

MORRIS HACKER,  
Superintendent of Roads.

The COMPUTING ENGINEER,  
District of Columbia.

Respectfully transmitted to the Engineer Commissioner District of Columbia, through Capt. H. C. Newcomer.

C. B. HUNT,  
Computing Engineer, District of Columbia.

itures for repairing county roads and suburban streets, fiscal year 1900-1901.

Location.	Amount.	Location.	Amount.
CENTRAL SECTION.		CENTRAL SECTION—continued.	
road, within line of Twen-		North Capitol street, at Seaton and	
reet.	\$81.87	T streets.	\$21.75
street, between Fourteenth		Brightwood avenue, between Rich-	
ghtwood avenue.	312.25	mond and Utica streets.	78.69
ct. Brightwood avenue.	145.52	Brightwood avenue.	95.50
re.	196.98	Grant street, between Seventeenth	
street, between Fourth		and Eighteenth streets.	64.12
ores lane.	33.87	S street, between Twenty-fourth	
od avenue, between Rock		street and Phelps place.	26.00
Church road and District		Twentieth street, through to Wyo-	
	890.13	oming avenue.	36.00
hapel road.	25.37	North Capitol street, between T	
ce street, between Thir-		street and Michigan avenue.	338.61
and Fifteenth streets.	1,275.68	Detroit street, from Twenty-fourth	
street, between Seventh		street east, Langdon.	370.85
nd Sherman avenue.	180.25	Brightwood avenue, from Bright-	
street, King's subdivision,		wood to District line.	529.13
d.	1,177.69	Flint street, from Brightwood ave-	
avenue, from Glenwood		nue east.	1,997.77
ry to Michigan avenue.	603.06	Sixteenth street, north of Howard	
between First and Le		avenue.	18.25
venue NW.	85.28	Grant street, between Seventeenth	
between First and North		and Eighteenth streets.	504.37
streets.	98.25	Baltimore street, between Nine-	
between Second street and		teenth and Twentieth streets.	415.18
avenue.	26.19	Brightwood avenue, between	
nd Klinge roads, Intersec-		Quincy and Richmond streets.	17.75
	30.66	Binney street, from Fourteenth	
th street, between Grant		street westward.	805.80
well streets.	30.50	Dangerous holes and minor repairs.	6,690.85
h street, between Wood-			99,159.19
l and Cincinnati street.	189.25	EASTERN SECTION.	
t street, between Twelfth		Minnesota avenue, south of Naylor	
teenth streets.	15.75	road.	26.25
th street, between Whit-		Pennsylvania avenue and Branch	
l Lydecker avenues.	175.00	avenue.	80.88
et, between Lincoln and		Bennings road.	257.94
t, and Sumner, between		Geisboro and Livingston roads.	254.81
reet and Brightwood ave-		Howard avenue, from Baltimore	
	000.50	and Ohio to Eastern Branch.	25.12
th street, Howard avenue,		Hamilton road.	201.50
Pleasant.	915.54	Walker road, from Hamilton road	
street, between First and		to District line.	302.62
streets.	323.25	Good Hope Hill road.	150.12
et, between Twelfth and		Bennings road, from Anacostia	
nth streets.	11.00	road to District line.	209.50
od avenue, between Savan-		Bennings Bridge, west causeway.	573.75
l Quincy streets.	50.62	Bennings road, east of bridge.	149.49
ce street, between Four-		Dangerous holes and minor repairs.	3,578.89
nd Fifteenth streets.	738.67		5,810.87
street, between Fort street		WESTERN SECTION.	
ode Island avenue.	115.74	Flint street and Reno road.	719.22
street, between Tenth and		Klinge road, from Linnean Hill	
nth streets.	1,421.44	road to Rock Creek.	2,325.71
reet, between Tenth and		Dangerous holes and minor repairs	4,085.77
1 streets.	5.75	Newark, from Wisconsin avenue	
street, between Emporia		eastward.	4,037.02
atin streets.	60.00	Joliet street, between Connecticut	
et, Meridian subdivision.	3.25	avenue and Zoo Park.	394.07
street, across Thirteenth			11,561.79
	23.00		
avenue.	4.18		
street, between Sixth and			
h streets.	278.37		
land and Harewood ave-			
	4.26		
reet, between Second and			
streets NE.	19.45		

## RECAPITULATION.

Central section .....	\$22,172.15
Eastern section .....	5,810.85
Western section .....	11,561.75
Hire of horse and buggy .....	313.00
Salaries, surface division .....	1,021.00
Salaries, property division .....	650.50
Blacksmithing .....	300.71
Fuel, purchase of tools, and miscellaneous labor .....	2,612.85
Purchase of trap macadam, and freight on same .....	13,375.59
Purchase of flint stone, cobble, gravel, pipe, and cement .....	2,056.14
	60,919.32
Amount of appropriation .....	\$80,000.00
Amount of repayments .....	941.60
	60,941.36
Balance of appropriation .....	22.62

## REPORT OF THE ENGINEER OF BRIDGES.

WASHINGTON, D. C., July 1, 1901.

SIR: I have the honor to submit the following report for the fiscal year ended June 30, 1901:

The expenditures under "Ordinary care of bridges" were as follows:

Amount of appropriation .....	\$4,000.00
Salaries .....	\$3,844.39
Coal, oil, and contingencies .....	33.82
Paint purchased .....	118.76
Balance .....	4.03
	4,000.00

Keepers were stationed at the Aqueduct Bridge, over the Potomac, and the Pennsylvania Avenue and Navy-Yard bridges, over the Eastern Branch. At the last-named structure the operation of the draw requires a keeper and helper, and at the other two the demands of the public convenience justify their retention. These men are special police officers, and, in addition to caring for the cleanliness and safety of the structures, they enforce public order, and have frequently made arrests and secured conviction in cases of violation of law.

The work of "Construction and repairs" is shown by the annexed table. The regular repairs consisted of painting the ironwork, removal of floors, and such minor repairs as were from time to time required. The structures are in good condition, requiring only such repairs as are due to their regular and continued use. An exception from this statement should be made in the case of the Navy-Yard (or Anacostia) Bridge (No. 55), which has been considered structurally weak, and, since the employment of the heavy motor cars of the Anacostia Railway Company, particularly so. The electric cars which now cross the bridge weigh, when empty, between 7 and 10 tons, and when loaded with people this load reaches a maximum of 17 tons. The bridge was not designed to carry such a heavy load. In addition, the draw is archaic, the bridge unsightly, much too narrow (the entire width of the roadway being taken up with car tracks), and totally inadequate to meet the demands of public travel, in consequence of which I have the honor to recommend that it be replaced with a modern structure of ample width. This recommendation has been made each year since 1887, and the conditions described in each of these several reports are to-day aggravated. The present bridge was constructed in 1875. Its condition is notoriously bad and worthy of serious consideration.

The principal item of expenditure under the appropriation for "Construction and repairs of bridges" is for the construction of a concrete arch bridge over Broad Branch, on the line of the Argyle road. The contract price for this bridge is \$3,767.50, \$3,228.20 of which will be paid from this appropriation, consuming the entire balance. The old bridge, of timber and iron, was built in 1888. It was structurally very weak, and entirely out of harmony with its surroundings. The new bridge, which will consist of concrete throughout, was designed by this office, assisted by Mr. Glenn Brown, architect. It has a span of 24 feet and a rise of 9 feet. This bridge is now under construction.

The other work—of considerable magnitude—under this appropriation consisted of laying new floors on bridges No. 50 (Cincinnati street) and No. 31 (Woodley

lane) and the purchase of lumber for bridge No. 55 (Anacostia), amounting together to \$8,396.57.

Three thousand one hundred and sixty-five dollars and twenty-six cents was expended from the emergency appropriation for the repair of certain roads and bridges damaged by the storm of June 2, 1900, in the reconstruction of a bridge over Piney Branch, on the line of Rock Creek drive. The bridge destroyed by the storm was of culvert construction, having a span of 10 feet. The plans for the new bridge were prepared by the Melan Arch Construction Company, of New York, under the direction of this office. It consists of a five-centered arch having a span of 24 feet and a rise of 9 feet. It is constructed of concrete, incasing nine 5 inch steel I beams. The entire bridge is faced with second-class masonry of a good description. The waterway is double that of the old bridge, and all foundations are carried to rock.

Twenty-two thousand dollars was appropriated for the construction of a bridge across Rock Creek, on the line of the Quarry road, in the Zoological Park, to be built under the direction of the Engineer Commissioner.

The old bridge was constructed of timber and iron, and was in a very unsafe condition. The plans for the new bridge were prepared by the Melan Arch Construction Company, under the direction of this office. It consists of a single seven-centered arch of 80 feet span and 14 feet rise, and has an effective discharge area of 1,200 square feet. It is constructed of concrete throughout, with a cement mortar face. The arch incases 10 steel-latticed girders. The foundations for the arch are carried to rock, and those of the wing walls extend about 6 feet below the natural surface of the ground. The bridge has been completed excepting the construction of the sidewalks and the grading of the creek. The present balance is \$775.39.

Concrete steel was used in these two bridges in preference to steel or stone, as it is thought that it combines the beauty and permanency of the stone arch with a cost not more than 50 per cent greater than that of a steel bridge, the cost of maintenance of which is a factor of great moment. This construction is particularly advantageous where a flat arch is essential, as in the case of these bridges.

Forty thousand dollars was appropriated toward the construction of a bridge across Rock Creek on the line of Connecticut avenue extended. The work is now under construction. This appropriation will result in the completion of the foundations of all piers from 2 to 9, inclusive. Pier 3 and part of pier 2 were previously constructed under the appropriation for 1899. All foundations have been carried to rock, and have been built up to within about 5 feet of the natural surface of the ground. The bridge, which was designed by Mr. Morison, will be of concrete with granite ashlar facing. The soffits of the arches and the spandrel walls, between the faces of the bridge, will be faced with light-colored brick.

Fifty thousand dollars was appropriated for continuing the construction of a bridge across Rock Creek on the line of Massachusetts avenue extended, provided the Commissioners purchase or condemn the necessary land, the title of which was not possessed by the District. The strip of land lying immediately adjacent to the creek was the only piece not possessed by the District. This was acquired by condemnation proceedings, at a cost of \$2,040.05. The \$50,000 appropriated made a total of \$225,000, which will complete the bridge. The work is now under construction. The masonry arch will be completed in October, after which must be made a fill of 250,000 cubic yards.

I have the honor to submit with this report a record of tests of bricks made in connection with the construction of the Massachusetts avenue bridge; also some tests made upon concrete sand, showing its weight per cubic foot with different percentages of water.

## Tabulation of brick tested for the engineer department

[NOTE.—The percentage of water absorbed by each brick was determined by the District for twenty-four hours at a temperature of 220° F., then immersed in water for twenty-four. The percentages here tabulated are by weight. The compressive strength of each brick was tested on its broadest bed in the following manner: The first three bricks in each half being tested and their mean tabulated. The first brick of the series (unlettered) between cardboard cushions one-fourth inch thick. The third brick (B) was tested between pine-boards, the fourth brick (C) had its compressed surfaces faced with plaster of sixth brick (E) was tested between pine-board cushions one-half inch thick.]

## COMPARISON OF TESTS

	Mean strength.	Relative strength.
WHOLE BRICKS.		
Set in plaster of paris.....	6,880	1.00
Between cardboard cushions.....	5,710	.83
Between pine-board cushions.....	4,400	.64

NOTE.—Average absorption of red brick, 9.93 per cent.

Designation.	Description of brick. *			
	Condition of clay.	Method of molding.		Size in inches.
1 Paving brick.....	Stiff mud ....	Machine ...	Re-pressed, wire end cut.	2.50 by 4.22 by 8.43
2 do.....	do.....	do.....	do.....	2.50 by 4.27 by 8.44
3 do.....	do.....	do.....	do.....	2.50 by 4.26 by 8.40
4 do.....	do.....	do.....	do.....	2.51 by 4.25 by 8.35
5 do.....	do.....	do.....	do.....	2.49 by 4.26 by 8.04
6 do.....	do.....	do.....	do.....	2.41 by 4.10 by 8.11
7 do.....	do.....	do.....	Re-pressed.....	2.48 by 4.12 by 8.57
8 do.....	do.....	do.....	do.....	2.42 by 4.11 by 8.54
9 do.....	do.....	do.....	do.....	2.50 by 4.26 by 8.44
10 do.....	do.....	do.....	do.....	2.40 by 4.15 by 8.58
11 do.....	do.....	do.....	do.....	2.43 by 4.10 by 8.53
12 do.....	do.....	do.....	do.....	2.42 by 4.14 by 8.55
13 do.....	do.....	do.....	Wire (side) cut.....	2.33 by 3.99 by 8.47
14 do.....	do.....	do.....	do.....	2.38 by 4.03 by 8.48
15 do.....	do.....	do.....	do.....	2.38 by 4.02 by 8.46
16 do.....	do.....	do.....	do.....	2.39 by 4.14 by 8.53
17 do.....	do.....	do.....	do.....	2.37 by 4.05 by 8.44
18 do.....	do.....	do.....	do.....	2.41 by 4.19 by 8.65
19 Building brick.....	Semidry.....	do.....	do.....	2.27 by 4.04 by 8.19
20 do.....	do.....	do.....	do.....	2.32 by 4.04 by 8.26
21 do.....	do.....	do.....	do.....	2.27 by 4.05 by 8.23
22 do.....	Stiff mud.....	do.....	Wire (side) cut.....	2.30 by 4.02 by 8.19
23 do.....	do.....	do.....	do.....	2.34 by 3.92 by 8.34
24 do.....	do.....	do.....	do.....	2.31 by 3.97 by 8.18
25 do.....	do.....	do.....	do.....	2.43 by 4.11 by 8.67
26 do.....	do.....	do.....	do.....	2.38 by 4.05 by 8.40
27 do.....	do.....	do.....	do.....	2.38 by 3.99 by 8.41
28 do.....	Semidry.....	do.....	Re-pressed.....	2.32 by 4.00 by 8.30
29 do.....	do.....	do.....	do.....	2.32 by 3.99 by 8.22
30 do.....	do.....	do.....	do.....	2.35 by 4.02 by 8.34
31 do.....	do.....	do.....	do.....	2.55 by 4.02 by 8.51
32 do.....	do.....	do.....	do.....	2.50 by 3.97 by 8.68
33 do.....	do.....	do.....	do.....	2.63 by 4.12 by 8.61
34 do.....	Soft mud.....	Hand.....	do.....	2.41 by 4.18 by 8.48
35 do.....	do.....	do.....	do.....	2.42 by 4.16 by 8.47
36 do.....	do.....	do.....	do.....	2.43 by 4.15 by 8.49
37 do.....	do.....	do.....	do.....	2.38 by 4..... by 8.33
38 do.....	do.....	do.....	do.....	2.21 by 3.96 by 8.19
39 do.....	do.....	do.....	do.....	2.32 by 4.00 by 8.31
40 do.....	do.....	do.....	do.....	2.34 by 4.12 by 8.32
41 do.....	do.....	do.....	do.....	2.36 by 3.97 by 8.34
42 do.....	do.....	do.....	do.....	2.29 by 4.09 by 8.31
43 do.....	Semidry.....	Machine.....	Re-pressed.....	2.46 by 4.12 by 8.57
44 do.....	do.....	do.....	do.....	2.48 by 4.19 by 8.59

District of Columbia, February 25, 1901.

of or asphalt and cements in the following manner: The brick was weighed after drying. After immersion the surface water was removed and the brick immediately weighed. By the Ordnance Department, United States Army, at Watertown Arsenal, Mass. Each were tested as whole bricks. The last three bricks in each series were tested as half bricks, compressed surfaces faced with plaster of paris. The second brick (A) was tested cushions one-half inch thick. Where more than three bricks of the same kind and manuf- the fifth brick (D) was tested between cardboard cushions one-fourth inch thick, and the

D BRICK.

	Mean strength.	Relative strength.
HALF BRICKS.		
plaster of paris.....	5,640	0.82
ten cardboard cushions.....	4,430	.64
ten pine-board cushions.....	4,540	.66

Description of brick.		Per cent of water absorbed.	Compressive strength in pounds per square inch.		Remarks.	
Color.	Weight in pounds.		Crack- ing.	Breaking.		
uniform red .....	5.91	13.8	2,420	5,250		1
.....	5.95	13.7	1,110	4,690A	True surface, free from flaws and cracks, even and compact texture.	2
.....	5.94	14.1	870	2,850B		3
.....	6.02	13.1	2,490	4,811C		4
.....	5.95	14	2,550	3,780D		5
.....	5.96	10.1	1,370	3,515E	Bottom very rough, free from flaws, very few cracks, even and compact texture.	6
.....	5.95	11.1	3,090	7,280		7
.....	5.96	9.6	2,210	5,730A		8
.....	5.93	14.1	1,020	4,510B		9
.....	5.94	10.5	2,560	6,025C		10
.....	5.92	11	1,500	4,225D		11
.....	5.96	10.9	1,870	3,525E		12
.....	5.85	7.1	7,960	9,150		13
more than average.						
uniform red .....	5.88	8.6	4,950	6,180A	Bottom and top surfaces very slightly concave, free from flaws and cracks, even and compact texture.	14
.....	5.79	9.1	3,180	6,680B		15
.....	5.89	11.7	4,000	7,545C		16
.....	5.91	8.9	2,860	6,225D		17
.....	6.04	11.3	1,650	5,470E	Face bricks, free from flaws and cracks, even and compact texture.	18
with light and dark brown specks.	5.42	5.3	13,360	18,400		19
.....	5.55	5.9	10,670	11,820A		20
.....	5.29	6.2	6,030	11,040B		21
(no specimen).	6	.5	2,820	13,550	.....do.....	22
.....	6.02	.3	980	15,750A		23
.....	5.96	.18	6,100	10,220B	Foundation and backing brick, true surface, free from flaws and cracks, even and compact texture.	24
uniform red .....	5.80	13.3	3,030	6,590		25
.....	5.65	10.6	1,820	6,180A		26
.....	5.81	7.9	2,450	5,800B		27
.....	5.62	9.5	5,590	10,570	Used for facing and backing, true surface, very few flaws and cracks, even and compact texture.	28
.....	5.51	7.4	980	7,840A		29
.....	5.67	6.3	1,550	5,700B		30
.....	6.24	8.1	6,310	9,120	Backing brick, slightly in wind, few cracks and flaws, fairly even and compact texture.	31
.....	6.26	7.9	2,750	6,020A		32
.....	6.58	8.5	1,170	4,480B		33
.....	5.50	11	4,330	5,110	Facing brick, true surface, free from flaws and cracks, even and compact texture.	34
.....	5.50	10.4	1,010	5,050A		35
.....	5.51	10	1,290	4,710B		36
.....	5.49	7.2	4,930	8,480		37
.....	5.05	5.8	120	9,020A	.....do.....	38
.....	5.46	6.4	240	5,400B		39
.....	5.35	9.4	4,110	5,885C		40
.....	5.39	6.3	1,930	5,505D		41
.....	5.46	6.4	4,450	5,820E	True surface, except bottom, which is very rough; few flaws, numerous cracks, even and compact texture.	42
numerous cracks and chips.	5.80	10	1,790	6,360		43
.....	5.94	9.8	2,000	4,700A		44

*Tabulation of brick tested for the engineer department*

	Designation.	Description of brick.			
		Condition of clay.	Method of molding.		Size in inches.
45	Sewer brick.....	Semidry .....	Machine .....	Re-pressed.....	2.41 by 4.14 by 8.57
46	do .....	do .....	do .....	do .....	2.50 by 4.20 by 8.65
47	do .....	do .....	do .....	do .....	2.40 by 4.09 by 8.55
48	do .....	Soft mud .....	Hand .....	do .....	2.48 by 4.15 by 8.59
49	do .....	do .....	do .....	do .....	2.55 by 4.06 by 8.55
50	do .....	do .....	do .....	do .....	2.51 by 4.07 by 8.67
51	do .....	do .....	do .....	do .....	2.38 by 4.08 by 8.50
52	do .....	do .....	do .....	do .....	2.35 by 4.06 by 8.46
53	do .....	do .....	do .....	do .....	2.40 by 4.05 by 8.49
54	do .....	Semidry .....	Machine .....	Re-pressed.....	2.80 by 4.22 by 8.55
55	do .....	do .....	do .....	do .....	2.40 by 4.06 by 8.45
56	do .....	do .....	do .....	do .....	2.50 by 4.16 by 9.04
57	Vitrified sewer brick.	do .....	do .....	do .....	2.47 by 4.27 by 9.05
58	do .....	do .....	do .....	do .....	2.53 by 4.10 by 9.13
59	do .....	do .....	do .....	do .....	2.45 by 4.25 by 8.92
60	do .....	do .....	do .....	do .....	2.46 by 4.22 by 8.92
61	do .....	do .....	do .....	do .....	2.45 by 4.23 by 8.99
62	do .....	do .....	do .....	do .....	2.49 by 4.07 by 8.70
63	Common brick .....	Soft mud .....	do .....	do .....	2.48 by 4.11 by 8.66
64	do .....	do .....	do .....	do .....	2.51 by 4.18 by 8.81
65	do .....	do .....	do .....	do .....	2.52 by 4.16 by 8.74
66	do .....	do .....	do .....	do .....	2.48 by 4.07 by 8.70
67	do .....	do .....	do .....	do .....	2.52 by 4.14 by 8.68
68	do .....	do .....	do .....	do .....	2.57 by 4.10 by 8.50
69	Sewer brick .....	Semidry .....	do .....	Re-pressed.....	2.52 by 4.10 by 8.47
70	do .....	do .....	do .....	do .....	2.49 by 4.07 by 8.52
71	do .....	do .....	do .....	do .....	2.46 by 4.09 by 8.47
72	do .....	do .....	do .....	do .....	2.50 by 4.18 by 8.63
73	do .....	do .....	do .....	do .....	2.54 by 3.98 by 8.42
74	do .....	do .....	do .....	do .....	2.56 by 4.14 by 8.56
75	do .....	do .....	do .....	do .....	2.60 by 4.10 by 8.50
76	do .....	do .....	do .....	do .....	2.59 by 4.17 by 8.55
77	do .....	do .....	do .....	do .....	2.60 by 4.16 by 8.48
78	do .....	do .....	do .....	do .....	2.58 by 4.29 by 8.60
79	do .....	do .....	do .....	do .....	2.65 by 4.25 by 8.61
80	do .....	do .....	do .....	do .....	2.37 by 4.20 by 8.54
81	do .....	Stiff mud .....	do .....	Wire (side) cut....	2.36 by 4.17 by 8.47
82	do .....	do .....	do .....	do .....	2.37 by 4.22 by 8.55
83	do .....	do .....	do .....	do .....	2.37 by 4.22 by 8.55

District of Columbia, February 25, 1901—Continued.

Description of brick.		Per cent of water absorbed.	Compressive strength in pounds per square inch.		Remarks.	
Color.	Weight in pounds.		Cracking.	Breaking.		
numerous cracks and etches.	5.85	10.9	2,700	6,840	True surface, free from flaws and cracks, even and compact texture.	45
do	5.93	13.7	2,560	4,680A		46
do	5.84	9.6	900	3,370B		47
coarser than average.	5.85	7.7	4,910	6,450		48
do	5.88	7.6	3,490	5,700A	do	49
do	5.90	8.4	710	3,340B		50
do	5.40	9.1	Not tested.			51
do	5.42	8.9	4,090	5,970	do	52
do	5.34	8.4	130	3,830A		53
burnt red	6.12	11.1	4,190	5,110		54
do	6.28	12.9	2,520	3,860A	do	55
do	5.64	10.5	2,010	4,120B		56
dark brown, with black speckles.	6.84	1.2	7,500	17,360		57
do	6.79	.48	1,000	11,470A	do	58
do	6.88	.64	6,370	9,270B		59
do	7.06	1.2	3,640	18,100		60
do	7.55	2.4	4,820	12,660A	do	61
do	7.30	1.05	2,420	7,550B		62
burnt red	5.81	9.1	5,220	6,100		63
do	5.91	9.3	2,000	5,450A	True surface, except bottom, which is very rough; free from flaws and cracks, even and compact texture.	64
do	5.98	10.4	950	3,060B		65
do	5.95	10.7	3,590	4,940C		66
do	5.81	9.5	2,470	3,895D		67
do	5.91	10.2	3,630	4,560E		68
do	6.06	11.8	4,400	5,180		69
do	5.95	12.9	120	4,440A		70
do	5.90	10.4	690	4,060B	True surface, free from flaws and cracks, even and compact texture.	71
do	5.93	10.7	4,300	5,230C		72
do	6.59	9.8	3,340	4,005D		73
do	6.17	7.6	2,740	5,775E		74
do	6.40	9.6	5,360	7,320		75
do	6.61	9	3,590	7,570A		76
do	6.35	11.6	2,220	4,400B	Surface slightly in wind, few flaws and cracks, even and compact texture.	77
do	6.42	10.4	3,460	5,050C		78
do	6.41	13.4	1,710	3,340D		79
coarser than average.	6.43	13.1	1,690	3,080E		80
glazed brown exterior rich cherry red inside.	6.28	8	4,130	6,130	Surface in wind, few flaws and cracks, hard burnt, almost vitrified, even and compact texture, contained from 30 to 40 per cent shale, No. 83 had one large crack.	81
	6.42	6.5	80	6,170A		82
	6.30	7.1	470	3,480B		83

In making the sand test, 4 cubic feet of dry sand was first weighed, then 1 per cent of water by bulk was added and thoroughly mixed with the sand by turning over 4 times with shovels and raking it at the same time. Then the wet sand was weighed, and after weighing one-half per cent more water was added, and the same operation repeated as indicated in the tabulation, until 19 per cent of water had been added. The weight of the dry sand was 93 pounds per cubic foot. This weight per cubic foot decreased as the water was added, until 5 per cent of water had been mixed with the sand, at which point it weighed 83.63 pounds. After this the weight per cubic foot increased until it reached its original dry weight of 93 pounds, which occurred when about 18 per cent of water had been added.

No. of test.	Per cent of water by bulk.	Weight of concrete sand per cubic foot.
1	Dry.	93
2	1	89.06
3	2	88.44
4	2½	87.35
5	3	86.85
6	3½	85
7	4	85
8	4½	84.65
9	5	83.63
10	6	83.51
11	7	83.94
12	8	87.75
13	9	88
14	11	88.75
15	13	89.25
16	17	92.06
17	19	94.25
18	23	96.75
19	29	98.50

In conclusion, I have the honor to recommend that the following amounts be appropriated for the fiscal year ending June 30, 1903:

For the ordinary care of bridges	\$4,000
For the construction and repair of bridges	25,000
For Anacostia Bridge (for necessary borings, surveys, estimates, and plans)	3,000
For K street bridge over Rock Creek (reconstruction)	20,000
For Connecticut avenue bridge over Rock Creek (for continuing construction)	200,000

It is thought that the \$200,000 recommended for Connecticut avenue will complete the bridge up to the actual springing line of the arches, which is considered a natural and proper limit. The appropriation for 1902, amounting to \$75,000, will complete the foundations, including those for the abutment walls, and will construct piers 2 to 4, inclusive, up to the top of the belting course.

*Expenditures, construction and repair of bridges, 1901.*

Order No.—	Bridge.	Character of work.	Cost.
6000	.....	Various bridges, July 1-15.....	\$5.75
6001	52	Painting.....	51.37
6002	.....	Cleaning various bridges.....	3.50
6003	30	Attaching knee braces.....	153.15
6004	20	Painting.....	94.50
6005	55	Relay sidewalk.....	44.76
6006	.....	Various bridges, July 16-31.....	1.25
6007	40	Lay new floor and painting.....	497.54
6008	39	do.....	412.18
6009	31	Lay new floor.....	1,581.53
6010	35	do.....	373.25
6014	.....	Various bridges, Aug. 1-15.....	4.38
6015	.....	Various bridges, Aug. 16-31.....	13.12
6016	35	Painting.....	141.50
6017	54	Repair railing.....	239.17
6018	.....	Various bridges, Sept. 1-15.....	3.62
6019	.....	Various bridges, Sept. 16-30.....	51.44
6020	30	Lay new floor.....	2,498.44
6021	.....	Various bridges, Oct. 1-15.....	58.70

*Expenditures, construction and repair of bridges, 1901—Continued.*

Order No.	Bridge.	Character of work.	Cost.
0022		Repair culvert (Bladensburg road).....	\$502.21
0023		Repair bridge (Twenty-fourth street, Langdon).....	51.18
0025		Various bridges, Nov. 1-15.....	2.25
0026		Various bridges, Nov. 16-30.....	35.86
0027	3	Relay floor.....	52.81
0028		Various bridges, Dec. 1-15.....	10.00
0029		Guard fence, Bladensburg.....	44.04
0030		Various bridges, Dec. 16-31.....	37.50
0031	30	Encase trestle posts, Cincinnati street.....	824.67
0032		Various bridges, Jan. 1-15.....	12.14
0034	31	Repair fence.....	69.54
0036		Various bridges, Feb. 16-28.....	13.48
0037		Various bridges, Mar. 1-15.....	7.58
0038		Quarry road bridge (lay drain pipe).....	9.00
0039		Repair culvert (Thirty-second street, north of U street).....	34.39
0040		Various bridges, Mar. 16-31.....	44.29
0041		Various bridges, Apr. 1-15.....	56.33
0042		Construct bridge (Forty-seventh street NW., near Utica street).....	69.28
0043		Various bridges, Apr. 16-30.....	18.63
0044		Various bridges, May 1-15.....	54.40
0045		Various bridges, May 16-31.....	24.94
0046	1	Repairing abutment.....	131.96
0047		Painting (Massachusetts avenue bridge).....	147.25
0049	55	Repair railing.....	52.48
0050		Various bridges, June 16-30.....	5.00
0051	30	Repair.....	1.25
	55	Lumber for floor (to be laid under appropriation for 1902).....	2,316.60
		Trap-rock macadam.....	209.17
		Specifications.....	10.75
		Miscellaneous labor.....	9.30
		Miscellaneous material.....	66.64
	19	Broad Branch bridge (now under construction).....	3,228.20
		Salaries.....	630.00
		Inspection.....	328.00
		Car tickets.....	10.00
		Total.....	15,378.25
Amount of appropriation.....			\$15,000.00
Repayments.....			378.25
Total.....			15,378.25

Respectfully submitted,

W. J. DOUGLAS,  
*Engineer of Bridges, District of Columbia.*

The COMPUTING ENGINEER DISTRICT OF COLUMBIA.

Respectfully transmitted to the Engineer Commissioner District of Columbia, through Capt. H. C. Newcomer.

C. B. HUNT,  
*Computing Engineer District of Columbia.*

## REPORT OF THE SURVEYOR.

WASHINGTON, July 31, 1901.

SIR: In response to the general order of the honorable Commissioners to report upon the operations of the surveyor's office for the fiscal year closing June 30, 1901, and to make such recommendations as are found necessary for the improvement of the efficiency of the office, I have the honor to report as follows:

The salient feature of the past year's work in this office is the extraordinary increase in the demands of private citizens and the District officials for surveys, subdivisions, and information. More than ever before is this office depended on for every service within its scope by heads of other District departments, a consummation which the surveyor has invited whenever opportunity presented, the result being to largely diminish duplication of surveys, and to transfer directly to the individual needing it information attested by the surveyor officially, and therefore available for use in court or as the final statement of the Commissioners in any case dependent upon survey. This very proper use of the office has had great effect in the increase of work done. As to work for private parties, the

office has been taxed beyond its physical ability during the entire fiscal year, and will be in arrears for a month yet, even with the third field party just organized (August 1, 1901).

Taking up in detail the various principal divisions of the work of the office and the percentages of increase over last year, it is found that the number of individual recorded lots surveyed for private parties is 836, an increase of 36 per cent. Twenty-four unsubdivided parcels of land were surveyed. Three hundred and twenty-seven subdivisions were made in duplicate and recorded, an increase of nearly 40 per cent. Of suburban tracts, 6 were subdivided into blocks and lots. One thousand and nineteen estimates of cost were made out in triplicate, the resulting orders being entered on the order book, which shows a total of 1,019 orders for private parties for survey or subdivision, or both, or for plats of all sorts, an increase of 28 per cent. In preparation for surveys and subdivisions, 1,019 plats of whole or parts of squares were made up, an increase of 28 per cent. Six hundred and eighty survey certificate plats were issued, and the same number of duplicates entered on the books, an increase of 40 per cent. At least 400 sketch plats of subdivisions were made on request of the inspector of buildings preliminary to issuance of building permits. Eighty-two large plats were prepared, of which 30 were recorded for the District, covering dedications, etc.

Indorsements were made on 577 engineer department communications, and 51 plats were forwarded therewith, an increase of 37 per cent.

For the District, surveys were made in 75 localities, scattered all over the District, in city and county, fixing lines of all kinds of municipal real estate and to obtain data for reports. Ninety reports were made to the Engineer Commissioner (other than those by indorsement), of which 14 included plats. Two hundred and fifty of the 577 indorsements were upon as many different subjects relating to the engineer department.

During the year the two field parties expended 663 hours in surveys for the District, and three times as much, or 1,963 hours, for private parties; total, 372 days of 8 hours, or 59 days of extra time—19 per cent over and above the ordinary office hours—and the office force worked at least 25 per cent overtime. The relative amounts of time expended for the District and private parties by the office force are very difficult to differentiate, but it is certain that at least one-third of the office time is expended in answering questions and assisting those interested in real estate in the examination of the records, which is as it should be.

In addition to the plats above noted, many others of a temporary character, probably 300, were made, bringing the total up to about 4,200, an increase of 36 per cent.

Three hundred and sixty-three letters were written and copied, and at least 300 other letters were written, of less important nature and not requiring copying; total, 663. Probably 4,500 telephone calls were made or answered.

In view of the fact, as above noted, that the increase in various branches of the work ranges from 28 to 40 per cent and actually averages at least 36 per cent over the work of the previous fiscal year, which itself exceeded the one back of that by 20 per cent, the surveyor is justified in stating that the work can not in reason be handled by less than three field parties, fully manned and equipped, and an office force of at least the present size.

The growth of the subdivision work is shown by the following table:

#### SUBDIVISIONS MADE AND RECORDED.

July, 1895, to July, 1896	83
July, 1896, to July, 1897	128
July, 1897, to July, 1898	122
July, 1898, to July, 1899	172
July, 1899, to July, 1900	229
July, 1900, to July, 1901	327

During the entire fiscal year the field work was behind, and until May 15, when the deficiency appropriation was first utilized, the office work had also accumulated so heavily that the increased force then put on barely succeeded in bringing inside work up to date, a most vital thing in view of the fact that the copying of the new records into the permanent books should not be delayed any longer than the reasonable time which must be allowed in any office of record. Recently the effort has been to check off and sign the pages of the record books each month, the original papers being retired at once after copies are signed and filed in the fireproof vault. Three series of books are kept, one for the city, including Georgetown, one for the "county," for resubdivisions and small plats, and one for large subdivisions of suburban land and other bulky plats. These are the record books

er, and in addition a most valuable series of certificate books of survey is by which every survey or plat of computation made since March 19, 1895, is served in precise duplicate in books on strong "bond paper," and by the aid of card-index system is instantly available for public inspection. Plans are on to make this series of records of surveys in the near future very much more able than now to all landed interests.

sufficient field force has made it practically useless to attempt the exceedingly arduous work of referencing valuable points of survey destroyed by street improvements. This is a deplorable loss, as whole days are often spent by a field force in what is often a vain endeavor to replace them. Hereafter it is hoped loss may be stopped.

Turning to matters not purely statistical, the fact is noted that an interesting landmark, the initial point or the corner of several original tracts west of Georgetown, known for many years as the "Dolly Barber tree," a huge poplar on south side of the New Cut road, west of Foundry Branch, has recently fallen. In order to preserve its exact site this office has placed a permanent monument at the center of the space once covered by the trunk (this monument carefully red to auxiliary points recorded in the office notes) to secure the main point against possible vandalism. With sufficient field force and the constant and hearty cooperation of the sewer and surface departments, which is hereby acknowledged, the important work of saving the sites of landmarks and points of survey can be easily done, replacing them by permanent marks in new granolithic sidewalks.

For several years a scrapbook has been kept up, into which are placed newspaper clippings of every subject in any way of interest to the office, including also articles of historical value regarding the city and District. A careful index of all is kept on cards. The constantly increasing value of such a collection is obvious. The progressive steps in all proceedings for opening streets and kindred acts are thus kept close at hand for public information, as well as for the current work of the office.

A very important advance has been made in the card-index system of the office by the steady employment of a competent typewriting force for some months. As a result, a few more days work will complete the index of all subdivisions made in Washington City and in Georgetown since their establishment, over a century ago.

By utilizing the thousands of cards, neatly and securely arranged in a card bureau file case, the public will be able to trace out on one or more cards the complete subdivisional history of each square, going directly from the street to the precise page of the record book whereon the subdivision in question is attested. The saving of labor by this system to all interested in real estate as owners, brokers, or title examiners is enormous, and incidentally the wear and tear on the books is reduced to the minimum. The crude old form of book index has been kept up also, at least for a while, for the benefit of the few people who cannot readily adjust themselves to the card index. Experience in the case of the county card index, now for a year or so in use, shows that scarcely anyone can do without the book index. During the next two months the county card index of subdivisions will be completely transferred from temporary slips to typewritten cards.

Every individual fragment of information of value to the office as well as all past and current work is being covered by the general index, which embraces subheads of maps, deeds of District of Columbia real estate, survey certificates, etc., the whole so disposed as to be eventually thrown all in together in one alphabetical order.

In March last, through the appropriation made by the last Congress, the entire survey collection of maps and notes came into possession of the office, and is found to be worth the cost. Nearly all of the 300 or 400 maps of this collection have been cross-indexed, numbered, stamped, and located in the card index. As to the office notes, their distribution by squares was accomplished by the personal work of the surveyor at home, the time occupied therein being from 7 to 11 p. m. at least four nights of each week for nearly two months and a half. This immense collection of papers, thousands in number, and covering practically all surveys made in Georgetown for at least twenty-five years, had no arrangement except that made partially in accord with "Old Georgetown" and various subdivisions and additions. The task of arrangement into something of reasonable readiness for use seemed at the outset almost interminable, and the present arrangement will require considerable revision, though the office can reach essential data without too long a search. This work done at the office would have been finished in about four years, assuming a continuance of the present demands upon the time and energies of the surveyor during office hours. Another matter engaging the personal attention of the surveyor, through many

nights of extra work, is the gradual overhauling and indexing of a mass of valuable papers, stored in the surveyor's office at the time of the extinction of Georgetown as a separate municipality and never indexed or inventoried since that distant date. So far many valuable documents have been found, enough to indicate the probability that practically all of these archives of Georgetown of interest to the surveyor's office are in the mass. Already from these papers has considerable light been shed upon the time and manner of the opening of the Georgetown streets. Apparently all the old-grade sheets of street improvements for over a century are there, enabling reproductions to be made of original profiles before any grading had been done.

I renew my recommendation of previous annual reports for \$2,000 for a resurvey of Beatty & Hawkin's addition to Georgetown on the basis of the holdings. It is needless to descant upon the imperative need of this.

I also renew my recommendation for an appropriation of \$2,000 for a complete relocation of the boundary line of the District, monuments to be placed at all road crossings and at other salient points.

Congress having appropriated \$2,000 for a resurvey of Barry farm, the work will begin in September and will be pushed to completion so far as the funds will permit.

During the year a series of five old maps, showing the original surface profiles on centers of most of the streets of the central and southern parts of the city, and also a scheme of grades, apparently made by Nicholas King in 1797, have been traced and thus essentially preserved, the originals being in the last stages of dilapidation. Several other important old maps of the original design of the city should be photolithographed to preserve them from utter loss. I recommend that \$300 be appropriated for this purpose.

The attempt to crowd into the very limited fireproof vault of the office the voluminous Brewer collection impels me to ask for \$600 for the enlargement of the metal map and file-case plant, all of which will be available in a new municipal building. Scores of valuable maps can not now be kept in the fireproof vault, for lack of room. The space now occupied by this office in the old city hall has now become, by increase in every division of the work, so crowded, even for the employees alone, that public business is retarded, and the increasing number of citizens who wish to examine the records have often not even space to spread out books for examination. There is no space whatever for those who wish to copy and trace from the records. The crying need for a decent municipal building is shown as plainly in this office as in any other. By the courtesy of the clerk of the supreme court this office has been loaned the temporary use of a room in the basement, which has been of great help, though but one man can work therein with natural light. As this office is in the city hall by sufferance merely, and is liable to be forced out altogether by the needs for space for the courts, the surveyor is thankful that he is allowed to remain at all, as the rooms are good and convenient, but in aggregate space not half large enough.

I wish to place on record my earnest recommendation that the appropriation for this office be made ample for the maintenance of just as many field parties as the work demands. In this day of rapid consummation of deals in real estate, time is a vital factor, and the general public should, in my judgment, be able to secure a report from this office in all ordinary cases inside of forty-eight hours, as to surveys of location of walls, etc., and no delay whatever should be permitted due to insufficient force. The exasperating experience of the past record-breaking season leads me to hope that never again shall the office be compelled to "make bricks without straw."

At least the incumbents of seven of the more important positions in the office should be placed on the permanent roll, especially in the cases of the chief clerk and assistant engineer.

The present force is worthy of the highest praise for its industry, accuracy, and general efficiency. The work accomplished is proof enough of this, and every man takes a personal pride in the character of the work turned out.

When the office was organized on its present basis, in 1895, the Commissioners had asked that the salary of the surveyor be fixed at \$3,600 and that of the assistant surveyor at \$1,800. As the law was passed the surveyor is given \$3,000 and the assistant \$1,800. Since that date the personnel of the office has doubled, the amount of work turned out has trebled and quadrupled in some respects, the fees turned into the District treasury have doubled, and the general importance and responsibility of the office has so very largely enhanced that now that the present surveyor has a reasonable hope of proper provision for every other need of the office, which has been his incessant effort for years to secure, he deems it not improper that he should recommend that the salaries of the surveyor and the assistant surveyor be increased to a point more commensurate with those of other heads

of departments in the District service and more in accord with the exceedingly heavy personal responsibility laid upon each, whose character is well known to the Board of Commissioners, and which is radically different from the responsibility of any other head of a department. Direct financial responsibility for any error that may occur by reason of the least break on the part of any subordinate is, in its last analysis, the burden carried daily by the surveyor, who can not possibly see everything of what is going on under his supervision. He can only institute and maintain such systems of checks as he finds practicable. The work of the assistant, which is chiefly the location of all lots and walls in the city proper, is most exacting and responsible. I recommend an increase to \$3,600 for the surveyor and \$2,500 for the assistant, these figures being nearer the ordinary commercial value of the professional services rendered the community by the two engineers required for the duty.

Very respectfully,

HENRY B. LOOKER,  
*Surveyor District of Columbia.*

Capt. LANSING H. BEACH,  
*Corps of Engineers, U. S. A.,*  
*Engineer Commissioner District of Columbia.*  
(Through Captain Newcomer.)

#### REPORT OF THE SUPERINTENDENT OF PARKING.

SIR: I have the honor to submit the following report of work performed under the supervision of this office during the fiscal year ending June 30, 1901.

Three thousand one hundred and twenty-five trees were planted on the public streets of the District, being 968 more than were planted during the previous fiscal year and more than have been planted in one season in the last fifteen years. These consisted of 983 sycamores, 863 soft maples, 491 Norway maples, 358 sugar maples, 228 American lindens, 123 American elms, 85 Salisburias, 75 pin oaks, 12 willow oaks, and 8 tulip trees.

Of this number, 2,767 were planted at public expense, and in accordance with instructions received, in filling vacant spaces in existing lines of trees previously planted. Three hundred and fifty-eight trees were planted at the cost of individuals under the permit system, the trees being furnished by the District, and the expense of preparing tree boxes, tree holes, and planting of trees being at cost of applicants.

The work of tree planting is necessarily of a scattered nature, but the order of June 30, 1900, requiring all existing gaps to be filled before attempting to plant new lines, permitted this work to be done in a far more systematic manner than ever before, and accounts for the increase of the number planted.

A portion of ground, consisting of about 5 acres, on Iowa avenue having been allotted to the parking commission for use as a nursery, this has been fenced, put under cultivation, and planted with 7,000 young trees. Large seed beds have been prepared and sown with the seeds of the varieties of trees considered most desirable for street culture, and the seedlings are now doing well.

One of the largest items in the list of annual expenditures is that of trimming trees, and of necessity, in justice to the trees, it must continue to increase. There are thousands of trees on the street, and particularly those planted near the curbing, that have attained a stage in their development and environment that necessitates trimming, and in very many cases severe trimming, if they are to be preserved. Trees planted at the curbing of a modern street are existing under conditions far less favorable for their welfare than similar trees planted in an open field. Surrounded as they are in very many instances by an air-tight and water-proof pavement, they naturally often suffer from lack of a sufficient supply of moisture at their roots. Their roots can not maintain a growth previously made during the existence of conditions more favorable (as, for instance, before the numerous cement sidewalks were laid); large limbs die back toward the trunks and present an ugly and neglected appearance. The only remedy is judicious trimming, and the entire amount of an annual appropriation would not be sufficient to complete the work of this character that needs to be done throughout the city.

Eight hundred and twenty-one trees were for various reasons removed from the streets. Many of these were killed by the resetting of curbing. Unfortunately, in the prosecution of this work the largest and finest trees usually suffer the most, having the largest root development. In cases where this work is contemplated on streets planted with large trees, particularly where grade is to be changed considerably, it would often be better, from an economic and aesthetic standpoint,

to remove the trees entirely and replace them when the sidewalk was relaid. This would often permit the trees to be more evenly spaced, and sometimes the planting of a more desirable variety. The young trees planted on the streets thus treated, growing under similar conditions, would present a more uniform appearance than where planted here and there among the existing old ones. In all cases trees should receive a trimming commensurate with their root mutilation, and the sooner this is done after the pavement is laid the better.

Among those removed because of street alteration were 79 from G street, between Sixth and Eleventh streets NW.; 11 from Fifth street, between F and G streets NW.; 22 from D street, between Ninth and Thirteenth streets NE.; 12 from G street, between Fifth and Sixth streets NW.; 15 from R street, between Thirty-second and Thirty-fourth streets NW.; 19 from Ninth street, between A and East Capitol streets SE.; 10 from Fifth street, between D and E streets NW.; 9 from Tennessee avenue, between B and Lincoln Park.

During the year no wire netting for the protection of trees from horses was purchased, and as a resulting sequence scores of young trees have been seriously injured, and in many cases irrevocably ruined. Trees, particularly of the soft-wooded varieties, once badly gnawed by horses, soon begin to decay at the place of damage, and the rotting continues until the inside of the trees becomes a hollow shell. There are several thousands of trees in the city approaching this condition, particularly soft maples and Carolina poplars, and experience has shown that horse-eaten trees are the worst sufferers during the annual autumnal storms.

Three hundred and seventy trees were wired by using the old wires taken from trees removed, and the greater portion of the city gone over and wires readjusted to accommodate the increased growth of the trees.

## DISTRIBUTION OF WORK.

Appropriation for year ending June 30, 1901 .....	\$22,500.00
Repayment vouchers .....	1,597.12
	<hr/> 24,097.12
Work at office in repairing tools, tree boxes, and damages reported by Metropolitan police department, etc .....	\$613.50
Work at old nursery, making tree boxes, general cultivation of stock, preparing seed beds, transplanting seedlings, digging trees, and trimming for street planting, etc .....	2,091.07
Work at new nursery, fencing and cultivating .....	197.68
Trimming trees .....	2,429.10
Digging tree holes .....	4,896.96
Planting trees .....	1,790.32
Paving around tree spaces .....	876.74
Removing trees .....	1,733.56
Cultivating trees .....	1,810.23
Rewiring and readjusting wires .....	1,098.86
Strapping .....	216.00
Care of parkings .....	1,582.41
Removing caterpillars .....	388.37
Removing old boxes .....	25.50
Gathering seed .....	67.40
Attending to police reports (broken limbs) .....	143.27
	<hr/> 19,960.97
Material: Timber for boxes, straps, soil, nails, staples, tools, and other miscellaneous articles .....	4,111.90
	<hr/> 24,072.87
Balance unexpended .....	24.25
From the emergency fund the sum of \$499.74 was used in the eradication of caterpillars.	
Four foremen, at \$3 per diem, were employed, \$3,516.	
The number of trees on streets as per last report was .....	80,227
The number of trees removed during the year .....	821
	<hr/> 79,406
Number planted during the year .....	3,123
	<hr/> 82,529
Total now on the streets .....	82,531

Four thousand seven hundred and twenty-three spaces around small or recently planted trees have been cultivated, and, in compliance with instructions received, have been sowed with the seed of white clover.

Three thousand five hundred boxes were made at the District nursery and used in planting trees and protecting small trees whose boxes had been broken by horses, storms, etc.

Respectfully submitted.

TRUEMAN LANHAM,  
*Superintendent Parking.*

Capt. LANSING H. BEACH,  
*Corps of Engineers, U. S. A.,*  
*Engineer Commissioner District of Columbia.*  
(Through Captain Newcomer.)

## SUBSURFACE AND BUILDING DIVISIONS.

Capt. CHESTER HARDING.

*Corps of Engineers, United States Army, Assistant to the Engineer Commissioner, in charge.*

WATER DISTRIBUTION.....	W. A. MCFARLAND, <i>Superintendent Water Department.</i>
WATER RATES.....	GEORGE F. GREEN, <i>Water Registrar and Chief Clerk,</i> <i>Water Department.</i>
SEWER CONSTRUCTION AND MAINTENANCE.....	D. E. MCCOMB, <i>Superintendent of Sewers.</i>
PLUMBING PLANS AND INSPECTION .....	CHARLES B. BALL, <i>Inspector of Plumbing.</i>
BUILDING AND BUILDING INSPECTION.....	J. B. BRADY, <i>Inspector of Buildings.</i>
	A. M. LAWSON, <i>Inspector of Elevators.</i>
REPAIRS TO BUILDINGS .....	G. B. COLEMAN, <i>Superintendent of Repairs.</i>

## REPORT OF ASSISTANT IN CHARGE.

OFFICE OF THE ENGINEER COMMISSIONER,  
DISTRICT OF COLUMBIA,  
Washington, October 2, 1901.

CAPTAIN: I have the honor to forward herewith the reports of the superintendent of the water department, the water registrar, the superintendent of sewers, the inspector of plumbing, the inspector of buildings, and the superintendent of repairs for the year ending June 30, 1901.

These divisions of the engineer department were under the immediate charge of Capt. D. D. Gaillard, United States Corps of Engineers, until about March 1, 1901, and were assigned to my charge on May 6, 1901.

Very respectfully, your obedient servant,

CHESTER HARDING,  
*Captain, Corps of Engineers,*  
*Assistant to Engineer Commissioner.*

Capt. LANSING H. BEACH,  
*Corps of Engineers, U. S. A.,*  
*Engineer Commissioner District of Columbia.*

## REPORT OF THE SUPERINTENDENT OF THE WATER DEPARTMENT.

WASHINGTON, D. C., August 7, 1901.

CAPTAIN: I have the honor to submit the following summary of work done by the distribution branch of the water department for the fiscal year ending June 30, 1901.

For a statement of mains laid, with their cost, together with other routine work attention is invited to the accompanying tables, which are self explanatory: a will be seen, the total length of new mains laid, of all sizes, was 65,812 feet, or about 12.5 miles.

The most important construction work of the year was the completion of the

TABLE II.—Summary of the distribution system.

	In service prior to June 30, 1901.	Added during fis- cal year.	Total June 30, 1901
75 inches diameter ..... linear feet..	660		
48 inches diameter ..... do.	30,000		30
36 inches diameter ..... do.	34,082		34
30 inches diameter ..... do.	37,720		37
24 inches diameter ..... do.	21,545		21
20 inches diameter ..... do.	36,356		36
16 inches diameter ..... do.	2,508		2
12 inches diameter ..... do.	192,517	10,026	202
10 inches diameter ..... do.	10,255		10
Total trunk mains ..... linear feet..	6,005		37
8 inches diameter ..... do.	1,389,069	52,018	1,441
6 inches diameter ..... do.	129,695	2,187	131
4 inches diameter ..... do.	60,500	935	61
3 inches diameter ..... do.	4,118		4
2 inches diameter ..... do.	3,156	646	3
Grand total .....	1,958,193	65,812	2,024
Stop valves ..... number..	4,037	191	4
Fire hydrants ..... do.	1,956	75	2
Public hydrants ..... do.	333	10	1
Service connections ..... do.	45,191	1,368	46
Horse fountains ..... do.	81	5	1

<sup>1</sup> 7,504 feet 6-inch main abandoned on account of electric railway construction.<sup>2</sup> 10 public hydrants abandoned.

TABLE III.—Statement showing cost of water mains laid during the fiscal year ending June 30, 1901.

Location.	Size.	Length.	Cost of material.	Cost of labor.	Total.
	<i>Inches.</i>	<i>Feet.</i>			
Square 369 .....	3	102.1	\$28.77	\$30.14	\$58.91
Square 503 .....	3	112.1	50.38	26.00	76.38
Square 44 .....	3	329.3	106.63	76.75	183.38
Square 568 .....	3	72.6	12.57	35.20	47.77
Square 469 .....	4	377.1	131.71	108.91	240.62
Bridge street, north from Highland avenue .....	4	129	56.99	53.15	110.14
Square 676 .....	4	234.7	154.12	138.85	292.97
Square 293 .....	4	225.8	99.78	84.87	184.65
Center Sheridan street, east from Piney Branch road .....	4	181.6	62.32	52.18	114.50
Scott street, west from Valley NW .....	4	215	91.49	58.91	150.40
Alley, square 234 .....	4	164.2	85.69	78.18	163.87
South side Massachusetts avenue, west from Sheridan circle NW .....	6	180	72.33	49.00	121.33
North side of R street, between Nineteenth and Twentieth streets NW .....	6	249.4	119.50	66.88	186.38
Center of Seaton street, west from North Capitol street NW .....	6	265	248.48	92.56	341.04
Center of Richmond street, north from Woodley road NW .....	6	372.5	172.19	68.25	240.44
Center of Woodley road, east from Idaho avenue NW .....	6	255	185.10	56.18	241.28
Center of Princeton, west from Sherman avenue NW .....	6	123.4	66.56	34.01	100.57
North side of South Carolina avenue, from Eleventh to Twelfth streets SE .....	6	378.1	217.43	149.06	366.49
Center of Flint street, from Fifth to Ninth streets, Brightwood Park .....	6	1,623	811.49	226.58	1,038.07
Center of L street, from Twelfth to Fourteenth streets SE .....	6	800.5	368.87	176.86	545.73
Center of D street, between Twenty-second and Twenty-third streets NW .....	6	44.9	20.59	15.37	35.96
Center of Omaha street, between Twelfth and Thirteenth streets, Brookland .....	6	465.4	256.05	94.11	350.16
Center of Fourteenth street, from D street to Tennessee avenue, and center of D street, east from Fourteenth street NE .....	6	454.6	221.24	156.82	378.06
West side of Eighteenth street, between Oregon avenue and S street NW .....	6	120.8	72.18	42.52	114.70

Competitive designs for a new pumping station building to be erected on Trumbull street were received from a number of architects on August 1. Those submitted by Mr. Henry Brauns, of Baltimore, Md., were accepted, and detailed plans and specifications for the building were prepared by him. This work will be advertised early in the ensuing fiscal year, and the work of construction will, it is hoped, be practically completed not later than June 30, 1903.

Plans and specifications have been made for steam generating equipment, and for water gates for this station, and bids for this work also will be asked at an early date.

During the fiscal year ending June 30, 1902, the principal work contemplated by this department, other than ordinary routine construction, maintenance, and repair, is as follows:

Building of gate houses and completion of roads, grading and fencing at Brightwood Reservoir.

Excavation for foundation of Trumbull street pumping station.

Execution of contract for building and for a large part of the mechanical equipment, and commencement of work of construction.

Laying of 48-inch suction mains to connect new station with Howard University Reservoir, and alteration of mains on Capitol Hill in anticipation of an extension of the high-service system to this locality.

In the matter of office records an important work accomplished was the completion of a duplicate set (about 300 sheets each 22 by 30 inches) of 50-foot scale maps giving locations of water mains over the entire District; this duplicate set of maps has been stored at the U street pumping station as a precaution against loss by fire: such a loss could never be fully repaired.

An additional record of much importance has been begun. This is a card index, on cards of 8 by 10 inches each, intended to give exact location of and all available data relating to every water gate on both supply and distribution systems of water supply throughout the District; this is a work of considerable magnitude and will probably require several years to perfect; a party of three men is engaged exclusively on this work and is making satisfactory progress. The card index covering all available data relating to fire hydrants has been continued and is proving of much value.

In conclusion I wish to record my appreciation of the efficient work done by the various employees of this department.

Very respectfully,

W. A. McFARLAND,  
Superintendent Water Department.

Capt. LANSING H. BEACH,  
Corps of Engineers, U. S. A.,  
Engineer Commissioner District of Columbia,  
(Through Captain Harding.)

TABLE I.—Mains laid and miscellaneous work during the fiscal year ending June 30, 1901.

New mains laid:		
12 inches diameter .....	linear feet ..	10,026
6 inches diameter .....	do .....	51,477
4 inches diameter .....	do .....	2,187
3 inches diameter .....	do .....	935
2 inches diameter .....	do .....	0
1½ inches diameter .....	do .....	646
6-inch connections to fire hydrants .....		1,096
Mains lowered .....		3,013
New stop valves .....		191
Fire hydrants erected .....		75
Fire hydrants moved to new locations .....		7
Public hydrants erected .....		10
Fountains erected .....		5

TABLE II.—Summary of the distribution system.

	In service prior to June 30, 1901.	Added during fis- cal year.	Total June 30, 1901.
75 inches diameter ..... linear feet..	600	-----	600
48 inches diameter ..... do.....	30,000	-----	30,000
36 inches diameter ..... do.....	34,082	-----	34,082
30 inches diameter ..... do.....	37,720	-----	37,720
24 inches diameter ..... do.....	21,545	-----	21,545
20 inches diameter ..... do.....	36,366	-----	36,366
16 inches diameter ..... do.....	2,508	-----	2,508
12 inches diameter ..... do.....	192,517	10,026	202,543
10 inches diameter ..... do.....	10,255	-----	10,255
Total trunk mains ..... linear feet..	-----	-----	375,879
8 inches diameter ..... do.....	6,005	-----	6,005
6 inches diameter ..... do.....	1,389,069	52,018	*1,441,087
4 inches diameter ..... do.....	129,695	2,187	131,882
3 inches diameter ..... do.....	60,500	965	61,465
2 inches diameter ..... do.....	4,118	-----	4,118
1½ inches diameter ..... do.....	3,156	646	3,802
Grand total.....	1,958,193	65,812	2,024,005
Stop valves..... number..	4,037	191	4,228
Fire hydrants..... do.....	1,956	75	2,031
Public hydrants..... do.....	333	10	343
Service connections..... do.....	45,191	1,368	46,559
Horse fountains..... do.....	81	5	86

\*17,504 feet 6-inch main abandoned on account of electric railway construction.

\*10 public hydrants abandoned.

TABLE III.—Statement showing cost of water mains laid during the fiscal year ending June 30, 1901.

Location.	Size.	Length.	Cost of material.	Cost of labor.	Total cost.
	Inches.	Feet.			
Square 309.....	3	102.1	\$28.77	\$30.14	\$58.91
Square 503.....	3	112.1	50.38	26.00	76.38
Square 44.....	3	329.3	106.63	76.75	183.38
Square 568.....	3	72.6	12.57	35.20	47.77
Square 469.....	4	377.1	131.71	108.91	240.62
Bridge street, north from Highland avenue.....	4	129	56.99	53.15	110.14
Square 676.....	4	234.7	154.12	138.85	292.97
Square 293.....	4	225.8	99.78	84.87	184.65
Center Sheridan street, east from Piney Branch road.....	4	181.6	62.32	52.18	114.50
Scott street, west from Valley NW.....	4	215	91.49	58.91	150.40
Alley, square 234.....	4	164.2	85.69	78.18	163.87
South side Massachusetts avenue, west from Sheridan circle NW.....	6	180	72.33	49.00	121.33
North side of R street, between Nineteenth and Twentieth streets NW.....	6	249.4	119.50	66.88	186.38
Center of Seaton street, west from North Cap- itol street NW.....	6	265	248.48	92.56	341.04
Center of Richmond street, north from Woodley road NW.....	6	372.5	172.19	68.25	240.44
Center of Woodley road, east from Idaho ave- nue NW.....	6	255	185.10	56.18	241.28
Center of Princeton, west from Sherman ave- nue NW.....	6	123.4	66.56	34.01	100.57
North side of South Carolina avenue, from Eleventh to Twelfth streets SE.....	6	378.1	217.43	149.06	366.49
Center of Flint street, from Fifth to Ninth streets, Brightwood Park.....	6	1,623	811.49	226.58	1,038.07
Center of L street, from Twelfth to Fourteenth streets SE.....	6	800.5	368.87	176.86	545.73
Center of D street, between Twenty-second and Twenty-third streets NW.....	6	44.9	20.59	15.37	35.96
Center of Omaha street, between Twelfth and Thirteenth streets, Brookland.....	6	465.4	256.05	94.11	350.16
Center of Fourteenth street, from D street to Tennessee avenue, and center of D street, east from Fourteenth street NE.....	6	454.6	221.24	156.82	378.06
West side of Eighteenth street, between Oregon avenue and S street NW.....	6	120.8	72.18	42.52	114.70

TABLE III.—Statement showing cost of water mains, etc.—Continued.

Location.	Size.	Length.	Cost of material.	Cost of labor.	Total cost.
	<i>Inches.</i>	<i>Feet.</i>			
of Cincinnati street, opposite Nine- street NW.	6	54	\$23.05	\$11.13	\$34.18
of D street, west from North Capitol W.	6	169.8	127.95	89.27	217.22
Chesapeake street, between Bright d Illinois avenues	6	103.3	70.29	35.12	105.41
Newark street, between Thirty-third ty-sixth; center of Thirty-third, be- Newark street and Highland avenue; f Highland avenue, east from Thirty- street Cleveland Park.	6	2,867.7	1,559.44	669.38	2,228.82
Richmond street, south from Woodley W.	6	277	129.51	38.06	167.57
S street, between First and Second NW.	6	12	6.51	7.30	13.81
of Cincinnati street, between Eight- d Nineteenth streets NW.	6	31.5	13.94	15.81	29.75
Twenty-sixth, from K to L streets NW Twenty-sixth, from Virginia avenue to NW.					
of F street, from Twenty-fourth street ty-fifth street NW.					
of F street, from Twenty-second street ty-third street NW.	6	3,423.3	2,416.25	1,450.47	3,866.72
le of F street, from Twenty-first to second streets NW.					
of G street, from Eighteenth to Nine- streets NW.					
of G street, from Twenty-second to third streets NW.					
of Third, north from L NW.	6	124.5	93.38	47.10	140.48
Philadelphia street, from Eighth street two avenue NW.	6	448	184.80	113.65	298.45
Providence street, from Thirteenth to h streets, Brookland.	6	1,296.8	654.19	473.55	1,127.74
of Twelfth, from E street to Maryland NE.	6	477.8	265.72	197.04	462.76
Erie street, from Champlain avenue to avenue; center of Ontario avenue, south is.	6	659.2	378.08	140.84	518.92
Seaton street, east from First street NW of Flagler street, from U street to Al- cet NW.	6	326.5	152.37	80.77	233.14
Erie street, from Fifteenth to Sixteenth NW.	6	1,482	838.25	208.49	1,046.74
New Jersey avenue, crossing K street SE of South Capitol street, from O street to SE.	6	330.2	190.17	192.52	382.69
	6	209.5	89.38	59.82	149.20
Fifteenth street, from Morris street to street NW.	6	900	488.15	205.86	694.01
of Florida avenue, south from W street	6	1,082.6	467.40	303.22	770.62
of U street, from Flagler street to street NW.	6	196	78.79	53.35	132.14
Seaton street, between First and Sec- ets NW.	6	227.4	124.91	41.85	166.76
Maple avenue, from Nichols avenue to oad, Anacostia.	6	246.5	107.50	73.37	180.87
Pierpont street, east from Wisconsin NW.	6	417.4	238.88	110.34	349.22
of East Capitol street, from Fifteenth E.	6	296.4	138.92	93.91	232.83
of G street, between Twenty-third and fourth NW.	6	96	55.68	25.00	80.68
of Twenty-fifth, between H and I streets	6	368.2			
of Twenty-fifth, between I and K streets	6	414.9	1,567.49	723.59	2,291.08
of Twenty-fifth, between K and Penn- avenue NW.	6	663.1			
of Florida avenue, at Vermont avenue	6	361.6			
Maple avenue, from Spring street to et, Anacostia.	6	224	97.61	55.00	152.61
Twelfth street, between Detroit and streets, Brookland.	6	776	352.17	190.35	542.52
of North Capitol street, north from a street.	6	111.4	47.67	42.43	90.10
of U street, between Flagler and First	6	124	63.24	26.05	89.29
	6	100.6	57.34	19.25	76.59

TABLE III.—Statement showing cost of water mains, etc.—Continued.

Location.	Size.	Length.	Cost of material.	Cost of labor.	Total
	<i>Inches</i>	<i>Feet.</i>			
West side of First, between B and C streets NE	6	541.2	\$278.84	\$179.87	\$458.71
East side of First street, north from Patterson street NE	6	40.3	33.20	8.75	41.95
East side of Twelfth, from E to F streets NE	6	450.3	183.43	109.23	292.66
North side Georgia avenue, east from Twelfth SE	6	188.8	126.85	38.50	165.35
Center of Third street, from R street to Quincy street NE; center of Quincy street, west from Third street NE	6	571.4	324.85	148.62	473.47
Center of Q street, from Twenty-first street to Massachusetts avenue NW	6	230	237.93	93.51	331.44
Center of Thirteenth street, north from D street SE	6	273	121.13	69.18	190.31
East side of New Jersey avenue, between New York avenue and L street NW	6	476	263.70	196.17	459.87
East side of Lincoln avenue, north from R street NE	6	282.8	157.30	100.11	257.41
Center of Twelve-and-a-half street, between Band C NE	6	116.8	54.44	19.06	73.50
Center of W street, between Fourth and Fifth streets NE	6	121.8	67.88	17.25	85.13
Center of Bismarck street, between Brightwood and Sherman avenues NW	6	352	147.88	94.93	242.81
West side of Fifteenth street, between G street and Maryland avenue NE	6	158.2	101.65	76.93	178.58
Center of Highland avenue, Cleveland Park	6	89.7	43.35	34.00	77.35
Center of Twenty-first street, between C street and New York avenue NW	6	301.4	191.90	61.24	253.14
Center of Kenesaw avenue, west from Sixteenth street NW	4	5.5			
North side of U street, between First and Second streets NW	6	433	191.87	105.00	296.87
Center of Thirty-first street, between K street and Chesapeake and Ohio Canal NW	6	238.7	113.79	54.07	167.86
Center of Sixth street, between D street and Louisiana avenue NW	6	57.6	26.43	114.05	140.48
East side Thirteen-and-a-half street, between D and E NW	6	238.9	216.78	168.64	385.42
Center of Spring street, between Maple avenue and Morris street, Anacostia	6	247.1	148.76	103.45	252.21
Center of Sherman avenue, between Princeton and Bismarck streets, NW	6	275.4	123.01	51.85	174.86
Center of Thirty-first street, between South street and Chesapeake and Ohio Canal NW	6	232	105.98	65.25	171.23
North side of D street, between Ninth and Tenth streets NE	6	152	64.48	76.28	140.76
South side of California avenue, between Eighteenth street and Florida avenue NW	6	201.5	125.42	93.89	219.31
West side of H street, between D and E streets NE	6	373.6	180.57	96.02	276.59
Center of Seaton street, between Third and Fourth streets NE	6	473.8	249.93	149.30	399.23
Center of Milwaukee street, east from Thirty-sixth street NW	6	467.3	250.91	121.23	372.14
Hurst place, between Elliott place and distributing reservoir NW	6	93	50.96	30.75	81.71
Center of First street, between Bates and Q streets NW	6	208.9	105.26	104.75	210.01
East side of Fourteenth street, between G street and Georgia avenue SE; north side of Georgia avenue, between Fourteenth and Fifteenth streets SE	6	294	107.81	58.25	166.06
West side of Eighteenth street, between S street and Oregon avenue NW; intersection Eighteenth street and Oregon avenue NW	6	442.5	189.13	101.43	290.56
West side of Twenty-ninth street, between Q and U streets NW	6	166	78.98	71.69	150.67
West side of Twentieth street, between P street and Massachusetts avenue NW	6	159.7	81.48	41.75	123.23
West side of Sixth street, from East Capitol street to E street NE	6	120	53.53	42.37	95.90
West side of Tenth street, between East Capitol and I street SE	12	2,410.2	2,441.77	865.54	3,307.31
Center of Second street, from East Capitol to C streets	12	81	3,954.68	2,063.17	6,017.85
Lincoln avenue, from Glenwood Cemetery gate to Cincinnati street; Cincinnati street, from Lincoln avenue to Fourth street E	12	3,870	1,886.41	902.82	2,789.23
	12	1,302.4	2,353.4	1,907.44	4,260.84
	6	16		643.54	659.54
Connections and appurtenances	4	2	1,275.54	884.63	2,160.17
	6	1,131.1			

TABLE III.—Statement showing cost of water mains, etc.—Continued.

Location.	Size.	Length.	Cost of material.	Cost of labor.	Total cost.
	<i>Inches.</i>	<i>Feet.</i>			
Water mains laid, paid for by the Capital Traction Company:					
East side of First street, between B and C streets NE .....	6	541.4			
West side of Twenty-sixth street, between Pennsylvania avenue and I street NW .....	6	1,100.3			
South side of F street, between Twenty-first and Twenty-sixth streets NW .....	6	2,243.9			
North side of F street, between Seventeenth and Twenty-first streets NW .....	6	2,011.9			
North side of G street, between Seventeenth and Twenty-fourth streets NW .....	6	2,361.6			
North side of G street, between Twenty-fourth and Twenty-sixth streets NW .....	6	1,069			
West side of Twenty-fifth street, between H street and Pennsylvania avenue NW .....	6	1,449.3			
West side of Seventeenth street, from G street to Pennsylvania avenue NW .....	6	157.4			
	3	319			
Mains laid, paid for by deposit .....	4	658			
	6	5,343.9			
Total cost for laying mains and connections, including repairs to improved pavements .....			31,064.94	\$15,907.70	\$47,062.64
Cost of erecting fire hydrants, including repairs to improved pavements .....			5,288.36	1,073.35	6,361.71
Cost of superintendence .....				1,930.35	1,930.35
Grand total .....			36,353.30	19,001.40	55,354.70

TABLE IV.—Statement of length and cost of water mains laid from July 1, 1878, to June 30, 1901.

Fiscal year.	30-inch.	24-inch.	20-inch.	16-inch.	12-inch.	10-inch.	8-inch.
	<i>Lin. feet.</i>	<i>Lin. feet.</i>	<i>Lin. feet.</i>	<i>Lin. feet.</i>	<i>Lin. feet.</i>	<i>Lin. feet.</i>	<i>Lin. feet.</i>
1878	40				3,719		
1879					7,409		
1880							
1881							
1882							
1883					1,625		36
1884					1,038		
1885					763		
1886					1,938	791	
1887			4,835		1,124	2,908	
1888					731		
1889		2,312	5,140		5,626	2,784	
1890							
1891					5,301		
1892					10,163		
1893			2,926	2,500	6,473		
1894			278		39,386		
1895		6,617			27,731		
1896		294	8,874		11,873		
1897			2,180		6,877		
1898					7,608		907
1899			1,914		2,230		
1900	10,902	35	1,282	48	157		
1901					10,026		
Total .....	10,942	9,258	27,429	2,548	151,978	6,573	903

## 104 OPERATIONS OF THE ENGINEER DEPARTMENT, D. C.

TABLE IV.—Statement of length and cost of water mains, etc.—Continued.

Fiscal year.	6-inch.	4-inch.	3-inch.	2-inch.	1½-inch.	Total.	Cost.
	<i>Lin. feet.</i>	<i>Lin. feet.</i>	<i>Lin. feet.</i>	<i>Lin. feet.</i>	<i>Lin. feet.</i>	<i>Lin. feet.</i>	
1878	12,781	30				16,570	\$14,846.20
1879	8,516	1,397				17,322	19,436.00
1880	3,024					3,024	
1881	3,709					3,709	3,119.70
1882	1,920					1,920	1,626.43
1883	4,084					5,735	8,073.70
1884	8,972					10,010	10,492.51
1885	27,766	358	485			29,572	25,865.35
1886	35,192		6,623			44,544	40,025.10
1887	30,041	292	7,124			46,414	56,951.00
1888	9,123	9,148	3,937			22,939	17,629.61
1889	36,742	6,571	8,753			67,928	79,342.16
1890	34,737	2,856	2,855			40,448	19,113.54
1891	56,893	3,142	11,013			76,249	49,702.65
1892	88,709	3,342	1,286			108,929	74,733.04
1893	54,173	8,336	3,458			72,440	56,339.29
1894	86,632	12,832	2,918			142,046	126,599.55
1895	103,785	5,442	2,733			146,308	134,502.31
1896	61,464	1,738	3,262			87,505	89,386.12
1897	71,266	10,595	992		2,104	94,014	77,954.81
1898	52,371	6,735	2,790	1,633	500	72,634	48,661.70
1899	84,291	4,662	2,701	79	133	96,000	65,774.32
1900	53,838	4,211	2,116	17	453	73,059	114,784.72
1901	52,018	2,187	935		646	65,271	47,429.71
Total	982,047	83,874	63,981	1,729	3,836	1,344,587	1,182,383.87

TABLE V.—Average cost per foot for laying mains of various sizes, excluding repairs to improved pavements, during the fiscal year ending June 30, 1901.

Size.	Linear feet.	Cost of material.	Cost of labor.	Cost of superintendence.	Total.
3-inch	616	\$0.322	\$0.239	\$0.0257	\$0.586
4-inch	1,529	.401	.268	.0309	.669
6-inch	34,639	.536	.275	.0370	.846
12-inch	10,026	.925	.357	.0584	1.340

TABLE VI.—Statement of length and cost of water mains laid for the extension of the high-service system of water distribution from July 1, 1893, to June 30, 1901.

Size of main.	Laid to June 30, 1900.	Laid during year ending June 30, 1901.	Total.
1½-inch	2,717		2,717
2-inch	1,095		1,095
3-inch	1,808		1,808
4-inch	4,722	895	5,417
6-inch	144,290	18,511	162,804
12-inch	81,672	2,353	84,025
16-inch	48		48
20-inch	14,529		14,529
24-inch	6,946		6,946
36-inch	10,902		10,902
Total	268,732	21,559	290,291

Total cost to June 30, 1900 ..... \$339,967.34  
 Total cost for fiscal year ending June 30, 1901 ..... 17,245.10

Aggregate cost to June 30, 1901 ..... 357,212.44

TABLE VII.—Daily average consumption, middle and high services.

Month.	Middle.	High.	Month.	Middle.	High.
1900.			1901.		
July	7,265,107	419,380	January	7,640,256	248,729
August	7,482,960	443,150	February	7,598,400	290,777
September	7,345,222	420,074	March	7,332,492	218,539
October	7,137,397	404,230	April	7,344,010	212,628
November	7,233,548	362,117	May	7,629,841	258,293
December	7,711,466	360,312	June	8,041,695	300,709

TABLE VIII.—Statement of the number of shallow and deep wells.

	Shallow wells.	Deep wells.	Total.
In service June 30, 1900 .....	67	40	107
Closed and discontinued during fiscal year ending June 30, 1901 .....	5	.....	5
In service June 30, 1901 .....	62	40	102

*Proposals for earth excavation of foundation of new pumping station, opened January 26, 1901.*

Name of bidder.	Price per cubic yard (estimated quantity, 15,000 yards).
Lewis Hatton .....	\$0.31½
E. G. Gummel .....	.34
Andrew Gleeson .....	.38½

All bids rejected.

*Proposals for furnishing curb and corporation cocks, opened February 2, 1901.*

Name of bidder.	Curb cocks.		
	½-inch (estimated quantity, 1,100).	1-inch (estimated quantity, 250).	1½-inch (estimated quantity, 150).
A. P. Smith Manufacturing Co.: <sup>1</sup>			
Inverted .....	\$1.30	\$2.00	\$3.00
Direct .....	.75	1.35	2.00
H. Mueller Manufacturing Co.:			
Inverted .....	1.22	2.14	3.41
Direct .....	.75	1.32	2.10
C. J. McCubbin Co.:			
Inverted .....	1.08	1.90	3.00

<sup>1</sup> Contract awarded.

Name of bidder	Corporation cocks.					
	½ inch (quantity, 900).	¾ inch (quantity, 350).	1 inch (quantity, 100).	1 inch (quantity, 100).	1½ inch (quantity, 50).	1½ inch (quantity, 50).
A. P. Smith Manufacturing Company <sup>1</sup>	\$0.75	\$1.00	\$1.20	\$1.75	\$3.00	\$4.00
H. Mueller Manufacturing Company..	.77½	.97	1.34	1.89	3.71	4.77

<sup>1</sup> Contract awarded.

*Proposals for constructing two gate houses at the Brightwood reservoir, opened May 4, 1901.*

Name of bidder.	Marble.	Granite.	Terra cotta.	Brick.	Columbian marble.	Blue marble.	Indiana limestone.
Antonio Malnati .....	\$28,096	\$21,168	\$12,843	\$12,392	.....	.....	.....
D. J. Mockabee .....	21,389	19,922	11,510	13,240	.....	.....	.....
Sam'l. J. Prescott & Co. ....	22,581	17,741	10,983	10,883	.....	.....	.....
Wm. A. Kimmel .....	17,000	16,053	10,729	10,979	\$21,819	\$16,555	\$14,506

<sup>1</sup> Contract awarded.

# 106 OPERATIONS OF THE ENGINEER DEPARTMENT, D. C.

*Proposals for erecting iron fence and gates at Brightwood reservoir, opened May 25, 1901.*

[Estimated quantity, 2,250 linear feet.]

Charles White & Co.....	\$2.50
Fred J. White.....	1.00
C. A. Schneider's Sons <sup>1</sup> .....	1.50
A. F. Jorss <sup>2</sup> .....	1.50

<sup>1</sup> Contract awarded.

<sup>2</sup> Bid informal.

*Proposals for earth excavation for foundation of new pumping station, opened June 29, 1901.*

[Estimated quantity, 15,000 cubic yards.]

Name of bidder.	Price per cubic yard
Andrew Gleeson <sup>1</sup> .....	\$0.25
Carmony & Hough.....	.25
John H. Hammersly.....	.50

<sup>1</sup> Contract awarded.

*Number of assistant engineers, clerks, inspectors, foremen, and other employees (exclusive of day laborers) in the employ of the water department of the District of Columbia, and the appropriation from which paid, for the fiscal year ending June 30, 1901.*

Designations.	Num-ber.	Per diem.	Appropriation from which paid.			
			Pumping expenses and pipe distribu- tion.	High-serv- ice sys- tem, water distribu- tion.	Purchase and re- pair of pumps.	Total.
Assistant engineer.....	1	\$5.00		\$1,500.00		\$1,500.00
Superintendent of construction.....	1	4.25	\$1,551.25			1,551.25
Inspector.....	1	5.00		1,400.00		1,400.00
Do.....	1	4.50	517.50	468.00		985.50
Inspectors.....	2	3.00	156.00	704.25		860.25
Do.....	9	2.50	1,585.00	2,733.75		4,318.75
Clerk.....	1	4.50	1,399.50			1,399.50
Do.....	1	4.00	612.00	628.00		1,240.00
Instrument man.....	1	3.50		682.50		682.50
Rodman.....	1	3.00		342.00		342.00
Do.....	1	2.50		482.50		482.50
Chainmen.....	2	2.25		585.00		585.00
Draftsman.....	1	3.00		933.00		933.00
Assistant foreman.....	1	3.50	1,090.25			1,090.25
Do.....	1	3.00			\$844.50	844.50
Assistant foremen.....	3	2.50		88.13	50.00	138.13
Machinist.....	1	4.00	1,293.00			1,293.00
Assistant machinists.....	2	3.00	1,696.75			1,696.75
Plumbers.....	2	3.50	1,995.00			1,995.00
Plumber.....	1	3.00	801.00			801.00
Storekeeper.....	1	3.00	861.00			861.00
Carpenter.....	1	3.00	659.25			659.25
Blacksmith.....	1	3.00	123.00			123.00
Do.....	1	2.75	717.06			717.06
Assistant tapper.....	1	2.50	768.75			768.75
Steam engineers.....	3	2.50	1,628.13			1,628.13
Steam engineer.....	1	2.00	472.00			472.00
Firemen.....	3	2.50	2,565.62			2,565.62
Do.....	2	2.00	1,174.00			1,174.00
Watchman.....	1	2.50		888.75		888.75
Messengers.....	2	1.75	1,218.87			1,218.87
Drivers.....	4	1.75	785.75	598.50		1,384.25
Driver.....	1	1.50	69.00			69.00
Total.....	56		23,739.68	12,154.38	894.50	36,788.56

## REPORT OF THE WATER REGISTRAR.

WASHINGTON, July 29, 1901.

CAPTAIN: I have the honor to submit the following report of the operations of the revenue and inspection branch of the water department for the year ending June 30, 1901:

Inspections made.....	111,299
Premises in which leaks were found.....	9,747
Water-rent bills delivered by inspectors.....	33,758
Water-main assessment notices served.....	1,222
Tax certificates examined.....	6,021
Taps issued.....	1,398
Stopcocks issued.....	1,381
Permits examined.....	2,558

During the fiscal year just closed a remeasurement and reexamination of all the houses in the District of Columbia supplied with Potomac water was commenced, and has been pushed steadily forward, so that at the present time the rerating is about two-thirds completed, and it is safe to estimate that the expense of this labor will be many times repaid by the large increase in revenue from premises heretofore underrated.

In November last the water-main tax branch of this department was transferred to the office of the assessor, and with it one of the clerks of this office, reducing the number to three, who are, even when business is at its lightest, unable to cope with the ever-increasing volume, thus necessitating the detail of inspectors to clerical work and reducing another force already far too small to cover a rapidly growing territory. For this reason I again invite attention to the request in my last annual estimates and this year's for an increase of two in the clerical and a like number in the inspection branch of this bureau.

An increase in the salary of one of the fourteen-hundred-dollar employees to sixteen hundred was urged in my last report. It is hoped that this advance will be procured, the same being for the clerk detailed as acting chief clerk, whose duties and responsibilities warrant the augmentation asked.

Five tables are herewith submitted.

Very respectfully,

GEO. F. GREEN,  
Water Registrar.

Capt. LANSING H. BEACH,  
Corps of Engineers, U. S. A.,  
Engineer Commissioner District of Columbia.  
(Through Captain Harding.)

TABLE I.—Financial statement from July 1, 1900, to June 30, 1901.

<b>Revenues:</b>		
Balance to credit of water fund July 1, 1900 (as shown by the auditor's books).....	\$308,487.00	
Schedule water rents.....	\$248,518.38	
Meter water rents.....	55,038.81	
	<u>\$303,557.19</u>	
Water-main tax.....	57,336.65	
Less abatement at 6 per cent.....	976.93	
	<u>56,359.72</u>	
Water taps and stopcocks.....	6,140.85	
Permits for building purposes.....	1,340.00	
Miscellaneous.....	647.87	
Water-service connections.....	1,075.53	
	<u>369,122.15</u>	
<b>Total.....</b>		<b>678,609.15</b>
<b>Expenditures:</b>		
Salaries.....	29,958.49	
Contingent expenses.....	2,157.16	
Refunds.....	1,040.69	
Pumping expense and pipe distribution.....	128,208.87	
Extension of the high service.....	176,648.47	
Purchase of water meters.....	55.00	
Interest on bonds.....	6,022.00	
Introduction of card system.....	1,378.18	
	<u>345,468.86</u>	
Less repayments.....	53,781.78	
	<u>291,687.08</u>	
Balance to the credit of water fund July 1, 1901.....		<b>386,922.07</b>

## 108 OPERATIONS OF THE ENGINEER DEPARTMENT, D. C.

TABLE II.—Comparative statement of revenues.

Fiscal year.	Water rents.	Water-main assessments.	Taps and stopcocks.	Permits, etc.	Total revenues.
1890.....	\$197,053.34	\$45,386.55	\$5,313.72	\$6,327.95	\$254,081.56
1891.....	200,664.29	50,332.93	5,640.00	6,869.79	263,506.99
1892.....	220,892.93	68,807.35	5,790.00	6,280.81	301,771.09
1893.....	235,911.25	70,026.33	7,307.09	7,931.71	320,176.38
1894.....	245,899.60	86,975.44	4,497.00	1,168.79	338,540.83
1895.....	251,872.71	72,972.24	4,537.55	2,100.60	331,483.10
1896.....	255,439.11	27,666.57	4,026.00	1,191.09	288,322.77
1897.....	253,500.16	53,653.39	5,157.00	1,128.28	313,439.83
1898.....	264,784.48	58,152.56	6,910.65	1,104.42	330,952.11
1899.....	276,035.54	62,937.43	6,327.00	1,545.15	346,845.12
1900.....	286,257.63	53,420.70	5,208.15	4,452.33	349,358.81
1901.....	303,557.19	56,359.72	6,140.85	3,064.39	369,122.15
1902 <sup>1</sup> .....	315,000.00	60,000.00	7,000.00	2,000.00	384,000.00
1903 <sup>1</sup> .....	325,000.00	60,000.00	7,000.00	2,000.00	394,000.00

<sup>1</sup> Estimated.

TABLE III.—Statement of assessments and collections of water-main taxes from July 1, 1878, to June 30, 1901.

Fiscal year.	Amount of water-main tax assessed.	Duplicate and over payments.	6 per cent abatement.	Amount of water-main tax canceled.	Amount of water-main tax collected.	Amount of water-main tax outstanding.
From July 1, 1878, to June 30, 1900.....	\$1,259,023.46	\$2,104.45	\$28,845.92	\$218,744.80	\$879,610.22	\$133,953.97
1901.....	38,798.74	-----	976.93	1,822.90	56,359.72	131,900.12
Total.....	1,297,822.20	2,104.45	29,822.85	220,567.70	935,969.94	115,854.09

<sup>1</sup> Of this amount, \$94,124.78 was outstanding and uncollected July 1, 1878.<sup>2</sup> This amount is the excess of the amounts collected, canceled, and abated over the tax levied.

## RECAPITULATION.

Amount of assessments and duplicate payments.....	\$1,297,822.20
Amount of abatement at 6 per cent.....	29,822.85
Amount of water-main tax canceled since July 1, 1878.....	220,567.70
Amount of water-main tax collected from July 1, 1878, to June 30, 1901.....	935,969.94
Amount of water-main tax outstanding July 1, 1901.....	115,854.09
	1,297,822.20

TABLE IV.—Premises in the District of Columbia supplied with Potomac water.

Number of dwellings—	North-west.	Northeast.	South-west.	Southeast.	Total.
To June 30, 1900.....	26,298	5,060	7,761	6,095	45,214
Year ending June 30, 1901.....	664	237	147	223	1,271
Total.....	26,962	5,297	7,908	6,318	46,485

nises in the District of Columbia supplied with Potomac water—  
Continued.

MISCELLANEOUS WATER TAKERS (UNMETERED).

	North-west.	Northeast.	South-west.	Southeast.	Total.
	5		1		5
	10	5	5	1	17
	21	6	1	9	41
	105	31	19	19	174
	1		1		3
	228	79	15	32	352
	290	13	16	17	306
	5				5
	4				4
	45	14	10	10	79
	9		1	1	10
	64	7	1	3	75
etc	77	13	17	17	124
	3				3
	15	2	3		20
	6		1		7
	3				3
ventions	47	8	3	7	65
	10		1		12
	18	5	1	3	27
	6			1	7
	80	16	17	21	134
	184	10	20	16	230
rs	12		1		15
	641	114	170	102	1,027
	1,485	336	225	250	2,296
	162	9	14	14	199
	6				6
	14	1	1	1	17
	4				4
ls	26	6	6	1	39
	6	1	1		8
	3,539	677	549	529	5,294

TABLE V.—Water meters.

	1-in.	1-in.	1-in.	1-in.	1½-in.	2-in.	3-in.	4-in.	6-in.	Registers.	Total.
	4	3	3	13	14	23	16	4			73
	4	3	108	93	59	34	5	3	1		310
	1	9	29	27	30	18	11	1	4		161
	6	3	149	187	112	53	13	7	2		532
		1	39	46	11	11	1	1			110
				3	1	1					5
			27	5	9	5		1	1		48
		1				4	5	1			11
			1	1		4					11
					4						2
		1		9	4	6	12				32
									5		5
	11	9	336	384	246	159	63	18	9	5	1,240

## REPORT OF THE SUPERINTENDENT OF SEWERS.

WASHINGTON, D. C., September 14, 1901.

CAPTAIN: I have the honor to submit the following report of the operations of the sewer division for the fiscal year ending June 30, 1901:

Under the appropriation for cleaning and repairing sewers and basins the following-described work was performed:

*Sewers and appurtenances cleaned and repaired.*

Cleaned:	
Pipe sewers .....	feet. 122
Main sewers .....	do. 12
Manholes .....	13
Catch basins .....	118
Gravel basins .....	
Basin outlets .....	
Street detritus and sludge removed .....	cubic yards. 11
Repaired:	
Pipe sewers constructed .....	feet
Pipe sewers taken up and relaid .....	do. 1
Main sewers repaired .....	do. 1
Basins constructed .....	
Basins reconstructed .....	
Basins repaired .....	
Flushing basins repaired .....	
Basin tops replaced (artificial and bluestone) .....	
Covers (cast iron) replaced .....	
Basins abandoned .....	
Manholes constructed .....	
Manholes reconstructed .....	
Manholes adjusted to grade .....	
Manholes repaired .....	
Manhole frames and covers replaced .....	
Manhole covers replaced .....	
Manholes abandoned .....	
Alley grates and frames replaced .....	
Alley grates replaced .....	
Alley basins repaired .....	
Total number of minor repairs .....	1
Total number of jobs of all kinds performed .....	1

A section (288.14 linear feet) of new invert was constructed in the North Cap street sewer between G and H streets; 50 artificial basin tops were constructed; the outlets of Anacostia main sewers were cleaned.

Amount expended for cleaning catch basins .....	\$11,861
Amount expended for manual flushing of sewers .....	5,701

The flushing gates at the outlet end of Tiber sewer were operated throughout the year, with advantage to the sewer.

The large number of boats in the canal prevents the improvement of its condition, which would otherwise result from the operations of the flushing gates.

The tidal sewers and sediment chambers were cleaned, as required.

Two flushing gangs were employed throughout the year flushing pipe sewers.

Under the appropriation for "Replacing obstructed sewers" the sewers in Fourteenth street N.W., between R and S streets, aggregating 872 feet, were replaced under contract. There were constructed by day labor 5,251 feet of pipe sewers varying in size from 10 to 18 inches in diameter, 744 feet of 6-inch lateral connections, and 33 manholes.

One hundred and fourteen house connections were made in connection with this work.

## MAIN AND PIPE SEWERS.

The sewer in First street N.E., between D and F streets, under contract with Adam McCandlish (contract 2744), was completed and charged to the appropriation for main pipe sewers, 1900.

Sewers were constructed under contracts: In Potomac Park between Twentieth street and the Potomac River, and in Twenty-sixth street between Water and D streets; in Nineteenth street N.W. between Q and R streets; in S street N.W.

between Fourteenth and Fifteenth streets; in Eighteenth street NW. between Q and Corcoran, and in New Hampshire avenue between Corcoran and Riggs streets. The main sewer in Sixteenth street NW. between K and L streets and in K street between Fifteenth and Sixteenth streets was begun by Contractor Adam Lindish under contract 2841, but was not completed. There were constructed by day labor 7,026 linear feet of pipe sewers, varying in size from 6 to 24 inches in diameter (44 manholes), divided among 39 jobs, the average length per job being 180.15 linear feet, and the average cost per job being \$29. There were also constructed 157 catch basins; 4,208 linear feet connection, varying in size from 6 to 24 inches in diameter; 11 manholes, and 39 linear feet gutter inlet, divided among 124 jobs, the average length of connection per job being 33.9 linear feet, and the average cost per basin job being \$100.297.

#### SUBURBAN SEWERS.

Five sewers were constructed under contracts in U street NW. between First and North Capitol streets; in Brandywine street between Seventh and Fifth streets, and in Fifth street between Brandywine and Des Moines streets; in T street between North Capitol and First streets, charged to the appropriation for urban sewers, 1900.

A sewer in the valley of Piney Branch, between Fifth and Chesapeake and 7 Branch road and Vermilion streets, was constructed under contract.

There were constructed by day labor 5,714 linear feet pipe sewers, varying in size from 8 to 24 inches in diameter (57 manholes), divided among 26 jobs, the average length per job being 219.77 linear feet, and the average cost per job being \$24.

#### ASSESSMENT AND PERMIT WORK.

*Permit work.*—There were constructed by day labor 8,038 linear feet pipe sewer, varying in size from 8 to 21 inches in diameter (57 manholes), divided among 59 jobs, the average length per job being 136.24 linear feet, the average cost per job being \$195.20, and the average cost per foot being \$1.433.

*Assessment system.*—There were constructed by day labor 21,298.4 linear feet sewers, varying in size from 8 to 18 inches in diameter (92 manholes), divided among 74 jobs, the average length per job being 287.81 linear feet, the average cost per job being \$403.39, and the average cost per foot being \$1.383.

#### AUTOMATIC FLUSHING TANKS.

Five flushing basins in various locations were constructed from the appropriation for automatic flushing tanks.

#### ROCK CREEK AND NEW JERSEY AVENUE HIGH-LEVEL INTERCEPTING SEWER.

Work under contract 2446, with J. K. Murphy, was completed; 866.3 linear feet sewer were constructed.

#### EXTENSION OF BOUNDARY SEWER.

There were constructed 101 linear feet invert for sewer 22 feet in diameter under contract 2889 with John Jacoby.

#### EAST SIDE INTERCEPTING SEWER.

There were constructed 1,749 linear feet of 6.25-foot-diameter sewer in the section between Twelfth street SE. and pumping station, and 1,229 linear feet of 6-foot-diameter sewer and 359 linear feet of 6-foot-diameter sewer in the section between Twenty-second and A streets NE. and Twelfth street SE., under contract 2743, with John Jacoby. Work is still in progress on both sections.

#### ARIZONA AVENUE SEWER.

There were constructed 1,061.6 linear feet 9-foot-diameter sewer and 754.4 linear feet invert for sewer 9 feet in diameter, being equivalent to 1,438.8 linear feet 9-foot-diameter sewer completed, 126 linear feet of 8.75-foot-diameter sewer and 856 linear feet invert for 8.75-foot-diameter sewer, being equivalent to 554 linear feet 8-foot-diameter sewer completed, under contract 2837, with Warren F. Brenizer. Work is still in progress on this sewer.

There were constructed by day labor 152.6 linear feet 6.75-foot diameter sewer.

## L STREET SEWER.

There were constructed 1,805 linear feet main sewer and 15 linear feet bell section under contract 2870 with Peyton D. Vinson. Work is still in progress on this sewer.

Under the appropriation for the "Preparation of detailed plans and specifications for sewage disposal complete" the following work was performed:

(1) *B street and New Jersey avenue trunk sewer.*—Surveys for this sewer along the various lines, including detail surveys of portions of the Mall, and borings have been completed; sizes determined, sections designed, and plans, profiles, and estimates prepared. The various detail sheets of connections, chambers, gates and regulators, and specifications are now being prepared.

(2) *Low-area trunk sewer.*—Surveys, including borings, have been completed and plan, profile, and estimates prepared. Tracings, estimates, and specifications for the first section have been prepared for contract. The details of connections at the sewerage pumping station are now being designed.

(3) *Water and L street intercepting sewer.*—Surveys, including borings and studies, for this sewer via L and M streets have been made, and the L-street location is recommended for adoption as the more desirable; also surveys and borings for branch lines except the branch south in Canal street and the branch in Water street. Sizes have been determined, sections designed, and plans, profiles, and estimates prepared. Detail sheets of sections, connections, gates and regulators, and specifications are now being prepared.

(4) *Four-and-a-half street high-level intercepting sewer.*—Surveys for this sewer, including its extension along B street south to Twelfth street west, and including surveys for the proposed Twelfth street southwest trunk sewer, have been made. Plans, profiles, and estimates have been prepared for these lines and for the alternative constructions involved, a study of which indicates the undesirability of the Twelfth street trunk sewer construction, and it is recommended that this project be abandoned. Detail sheets of outlet section, tide gates, connections, and sections are now in course of preparation. Estimate of cost, required sizes, grades, and plan of the extension of this sewer along B street south from Sixth to Twelfth street have been furnished (#31851 E. D. 1900).

(5) *Rock Creek and B street intercepting sewer.*—Surveys for the completion of this sewer, from Virginia avenue and B street to Twenty-first and Water streets, including borings, have been completed, and plan, profile, and estimate prepared. Designs and detail plans for gates at Virginia avenue and at G street, and for regulator at the crossing of the Easby Point and F street intercepting sewer, are yet to be prepared.

(6) *Outlet section Tiber Creek and New Jersey avenue high-level intercepting sewer.*—This outlet section has been designed, and plan, profile, detail drawings, and specifications prepared for contract. The construction has been commenced under contract No. 2893.

(7) *Temporary sewage pumping station.*—Plans and specifications for the pumping plant for this section have been prepared for contract. Its construction, under contract No. 2897, with the Camden Iron Works, is now under way. The pump well, suction conduit, and screen well have been designed and partly constructed under contract No. 2898.

(8) *Sewage disposal pumping station.*—General plans and the specifications for the pumps and machinery have been prepared for contract. The detail plans of sediment chamber, conduits, and gates are now being prepared.

(9) *Siphons under Anacostia River.*—Surveys and borings for the crossing of the Anacostia River have been made both on the line laid down by the sewerage commission and on a line about normal to the proposed channel lines for the river. The latter involving the extension of the outfall sewer on pile foundation, to the established bulkhead line, will reduce the length of the siphon line from 2,680 feet to 1,428 feet, and is recommended. Plans have been made for this line. Detail sheets of sections, chambers, etc., and estimates are now being prepared.

(10) *Outfall sewer.*—Surveys for this sewer, including a large amount of detail topography, especially over the more rugged portions of the line, and borings have been made. The topography has been mapped, the map location made, and the lines and profiles run. In addition, surveys of intersecting streams and drainage have been made and plans for by-passing the streams and drainage worked out, and detail sheets and estimates therefor prepared.

(11) *Outlet section at Magazine Point.*—Surveys of the shore and channel in the vicinity of Magazine Point have been made and mapped, and the location of the outlet section made.

Plan, profile, and detail sheets are now being prepared.

Upon the subject of the construction of service sewers, I respectfully reiterate my recommendation contained in the annual report for the fiscal year 1898: "I respectfully invite attention to an absence of equity in the construction of service sewers. In consideration of the fact that the larger sewers are larger and more expensive because they are required as outlets for smaller sewers, it has seemed unfair that they should be charged against the abutting property, and the practice of the office is to construct sewers of greater size than 12 inches in diameter from the appropriation for main and pipe sewers or the appropriation for suburban sewers. Sewers 12 inches and under in diameter are usually constructed under the assessment system, in which case one half of the cost is taxed against the abutting property. According to this practice, property abutting upon sewers above 12 inches in diameter is not taxed on account of the sewer construction, although it receives as much benefit as property which is taxed for the construction of sewers under the assessment system. Again, under the assessment system the owner of the corner lot is, in many instances, compelled to pay as much as five times the amount assessed against the adjacent lot of equal area, each receiving equal benefit. In my opinion all properties abutting upon a service sewer should pay a proportion of its cost, and assuming the average cost of 12-inch sewers as a foundation, \$7.50 for each 1,000 feet of lot area would place the charge upon a fair basis."

I would respectfully suggest that it would be a great help to the work of the office if the construction appropriations were so made that they would be available until expended instead of lapsing with the fiscal year. There is no apparent advantage in the present arrangement, and many disadvantages. I also suggest that an effort be made to raise the limit of expenditure permissible by day labor from \$1,000 to \$3,000. This is especially desirable for emergency and repair work.

## TABLES.

Table 1 shows work performed under contract.

Table 2 shows work performed under the permit system (voluntary system).

Table 3 shows work performed under the assessment system.

Table 4 shows work performed at whole cost to the applicant.

Table 5 shows work performed by day labor chargeable to the appropriation for replacing obstructed sewers.

Table 6 shows work performed by day labor chargeable to the appropriation for main and pipe sewers.

Table 7 shows work performed by day labor chargeable to the appropriation for suburban sewers.

Table 8 shows work performed by day labor chargeable to various appropriations (of other departments), the appropriation for automatic flushing tanks, and Arizona avenue sewer.

Table 9 shows average cost per foot of sewers and the average cost of basis constructed by day labor.

Table 10 shows number of inspectors, foremen, and other employees of the sewer division in the offices of the chief clerk, engineer department, and the disbursing officer, inspector of asphalts and cements, and in the engineer department stables temporarily employed, and the appropriation from which these employees were paid for the year ending June 30, 1901.

Table 11 shows the number of electric conduits laid from March 27, 1900, to June 30, 1901, and the total number of feet of conduit in use at latter date.

Very respectfully, your obedient servant,

D. E. McCOMB,  
*Superintendent of Sewers.*

Capt. LANSING H. BEACH,  
*Corps of Engineers, U. S. A.,*  
*Engineer Commissioner District of Columbia.*  
(Through Captain Harding.)

TABLE 1.—Statement of sewers constructed under co

Num- ber of con- tract.	Contractor.	Location.	Size of sewer.	Length of sewer.
				<i>Feet.</i>
2769	Andrew Gleeson ..	North Capitol street, between G and I streets.	20 feet diameter.	288
2744	Adam McCandlish.	First street NE., between D and F streets.	2.75 by 4.125 feet...	448.5
		do	2 by 3 feet.....	441.4
2777	Peyton D. Vinson..	U street NW., between First and North Capitol streets.	2 by 3 feet.....	7 380.4
		Brandywine, between Seventh and Fifth, and Fifth between Brandywine and Des Moines streets.	21-inch .....	788.2
		T street NW., between North Capitol and First streets.	21-inch .....	1,196.6
2632	T. B. Jones & Co...	North portion Tiber Creek and New Jersey avenue, high- level interceptor.	14 feet by 14 feet 3 inches diam- eter.	815.5
			9 feet by 11 feet diameter.	2,130.7
2446	J. K. Murphy .....	Tiber Creek and New Jersey avenue, high-level intercept- ing.	14 feet by 14 feet 3 inches diam- eter.	335.3
2743	Jno. Jacoby .....	East side intercepting sewer, Twelfth street SE. and pumping station.	6.25 feet diameter	6,075.3
		East side intercepting, Twenty- second and A NE., and Twelfth street SE.	6 feet diameter..	7 866.3
2889	do .....	Extension of boundary sewer..	22 feet diameter	3,304
			9 feet diameter sewer.	1,749
2837	W. F. Brenizer .....	Arizona avenue .....	9 feet diameter invert.	1,229
			8.75 feet diam- eter sewer.	359
			8.75 feet diam- eter invert.	101
2870	Peyton Vinson ....	L street NW., between Twen- ty-first and Sixteenth streets.	Bell section .....	1,438.8 of sewer
			6.5 feet diameter	554 of 8 sew
			5.75 feet diameter	15
			5.5 feet diameter	15
2841	Adam McCandlish.	Sixteenth street NW., between K and L streets.	2.4 by 2.72 feet...	005
		Potomac Park, Twenty-sixth and River, and Twenty-sixth, between Water and D streets.	24 inches diam- eter.	1,185
		Nineteenth street NW., be- tween Q and R streets.	24-inch .....	651.5
2870	Peyton D. Vinson ..	S street NW., between Four- teenth and Fifteenth streets.	24-inch .....	229
		Eighteenth street, Q and Cor- coran, and New Hampshire avenue, Corcoran, and Riggs	24-inch .....	510.5
		Fourteenth street NW., be- tween R and S.	21-inch .....	137.1
2829	Andrew Gleeson ..	Valley of Piney Branch, be- tween Fifth and Chesapeake, and Piney Branch road and Vermilion street.	21-inch .....	585.3
			18-inch .....	543.3
			18-inch .....	192.4
			21-inch .....	69.1
			18-inch .....	594.1
			15-inch .....	73.7
			12-inch .....	87.5
			12-inch .....	478
			12-inch .....	394.2
			12-inch .....	3,114.5
			12-inch .....	3,889.6
			12-inch .....	1,627.1
			12-inch .....	999.6

<sup>1</sup> Includes work previously reported upon.<sup>2</sup> Includes \$104 charged to contractor.<sup>3</sup> Includes \$327.23 for repairs to streets, and \$11.62 for raising fire hydrant, charged to contractor.<sup>4</sup> Cost of restoration of rubble walls in Capitol grounds, relaying water main in Arthur and repairing outside of trench, charged to contractor.<sup>5</sup> Includes \$28 charged to contractor.<sup>6</sup> Includes \$9.93, cost of repairing water main, charged to contractor.

OPERATIONS OF THE ENGINEER DEPARTMENT, D. C. 115

chargeable to appropriations for fiscal years 1900 and 1901.

Allowance to contractor.	Material furnished		Cost of inspection.	Cost of repairs to pavements.	Total cost.	Appropriation.
	Chargeable.	Not chargeable.				
\$3,164.20	\$24.62	-----	\$149.00	-----	\$3,937.82	Cleaning and repairing sewers and basins, 1900.
2,651.30	906.00	\$20.30	*380.00	*\$307.52	1 4,565.12	Main and pipe sewers, 1900.
7 808.32	-----	-----	7 144.00	-----	-----	
579.80	108.89	463.94	56.00	-----	1,208.63	Suburban sewers, 1900.
1,004.80	207.40	703.74	140.00	-----	2,055.94	Do.
887.01	107.67	467.14	40.00	-----	1,501.82	Do.
107,085.45	15,001.25	112.49	2,479.00	*2,051.30	126,679.49	North portion Tiber Creek and New Jersey avenue, high-level intercepting sewer.
7 14,914.54	-----	-----	-----	-----	-----	-----
239,981.80	43,455.74	508.90	8,583.62	*5,194.34	(1)	Tiber Creek and New Jersey avenue, high-level intercepting sewer.
7 58,085.90	-----	-----	7 1,990.00	-----	-----	
51,574.04	-----	-----	2,362.50	-----	(1)	East side intercepting, between Twelfth street SE. and pumping station.
7 38,850.44	-----	-----	7 1,528.50	-----	(*)	
20,757.10	-----	-----	1,508.50	-----	(*)	East side intercepting, between Twenty-second and A streets NE. and Twelfth street SE.
4,886.98	-----	-----	308.00	-----	(*)	
22,748.03	-----	-----	804.00	-----	(*)	Extension boundary sewer, 1900.
12,035.98	-----	-----	784.00	-----	(*)	Arizona avenue sewer.
1,973.05	-----	-----	280.00	-----	(*)	L street sewer.
1,918.47	580.24	93.07	176.00	-----	2,767.78	Main and pipe sewers, 1901.
1,444.78	128.83	508.22	*132.00	*56.28	2,268.09	Do.
1,475.36	175.29	649.39	114.00	70.07	2,484.11	Do.
1,609.06	99.28	549.84	118.00	745.01	3,119.19	Do.
1,061.67	153.17	261.10	58.00	682.08	2,216.02	Replacing obstructed sewers, 1901.
11,489.18	1,262.07	4,152.05	784.00	-----	17,687.30	Suburban sewers, 1901.

\* Figures in red show length of sewer constructed and allowance to contractor in fiscal year 1901.

\* Includes cost of repairs to bulkhead Canal and E streets, restoring surface Garfield Park, restoring trees Delaware avenue, moving water mains South Capitol and C streets, restoring Capitol grounds, moving water-main valve in Reservation No. 17, moving fire hydrant Canal and E streets, moving and restoring street lamps Delaware avenue and Second and I streets, repairs to car tracks Canal and E streets, repairs to car tracks B street SE., charged to contractor.

\* Work incomplete; payment made on account.

TABLE 2.—Statement of sewers laid under the appropriation for assessment

VOLUNTARY

No. of order.	Location.	Pipe sewers laid (length in feet).						Manholes.	Basins.	Branches.
		8-inch.	10-inch.	12-inch.	15-inch.	18-inch.	21-inch.			
17	Belmont avenue NW., between Eighteenth and Columbia road.	137						1		7
36	Block 9, Bloomingdale.	13								10
67	Block 7, Bloomingdale.	7								10
19	Bridge street (Cleveland Park).	109								10
	Connecticut avenue between Nourse and Pierce Mill road.			797				1		
2	Decatur street NE., between O and P and First and North Capitol streets.			81				1		6
12	D street NE., between Fourteenth and Fifteenth streets.			350				1		7
25	D street NE., between Fourteenth and Fifteenth streets.			28				1		2
33	Delaware avenue SW., between K and L streets.			50				1		1
1	Eighteenth street NW., between T and Willard streets.							1		
34	Eighth street SE., between North Carolina avenue and A street.		179					2		7
5	Folsom street (Cleveland Park).	48								3
13	F street NE., between Third and Fourth streets.	14								1
15	Fourteenth street NE., between D and Duncan and crossing Tennessee avenue.		152					1		4
24	Fourteenth street NE., between D and Duncan streets.		84					1		6
26	Flagler street NW., between U and V streets.			7 300				1		12
27	Flagler street N.W., between W and Albany streets.		394					4		14
28	Flagler street N.W., between V and W streets.		403					4		14
40	First street N.W., between Randolph and S streets.		123							6
41	Northwest corner Fourteenth street and Pennsylvania avenue NW.							181		
55	Florida avenue NE., between Trinidad avenue and Fourteenth street.				8			1		1
61	Fifteenth street NE., between G street and Maryland avenue.		26							1
62	First street SW., between N and O streets.			26						1
63	Block 1, Fairview Heights.	285						1		9
39	G street SE., between Fourteenth and Fifteenth, and in square 1064.		228	168				5		27
	Kling, Ford & Woodley roads, between Connecticut and Wisconsin avenues.		1,559.9	3,039.2				13		3
14	K street NE., between First and Delaware avenue.				11					1
16	Kentucky avenue, between B and South Carolina avenue.		20							1
51	Kalorama avenue, between Eighteenth and Columbia road.			68						1
11	Kentucky avenue, between B and South Carolina avenue.		16							2
69	Block 7, Kalorama.		150							3
54	Crossing L'Enfant circle.						180	1		
7	L street SE., between Thirteenth and Fourteenth streets.					307		1		30
57	L street SE., between Third and Fourth streets.		103					2		2
8	North Carolina avenue SE., between Seventh and Eighth streets.			62						1
22	North Capitol, between T and Seaton, and T from North Capitol eastward.	138	127					1		8

<sup>1</sup> Balance brought from job 35.<sup>2</sup> Balance brought forward from job 66.<sup>3</sup> Constructed under contract 2909 by M. F. McNamara & Co.<sup>4</sup> Balance carried to job 15.<sup>5</sup> Balance brought forward from fiscal year 1900.<sup>6</sup> Balance brought from job 12.<sup>7</sup> There were 324 linear feet 6-inch pipe used in making connections.<sup>8</sup> Balance carried to job 27.

and permit work, and whole cost to applicant, for fiscal year 1901.

SYSTEM.

Amount of deposit.	Cost to District of Columbia.	Cost to applicant.	Total cost.	Amount returned.	For whom done.	Overseer.	Date of completion.
\$150.00	\$150.00	\$150.00	\$300.00	-----	Geo. S. Cooper....	Thomas.....	Nov. 20, 1900
(1) 9.01	9.02	9.02	18.03	-----	Ray E. Middaugh,	Ward.....	Apr. 22, 1901
(2) 4.27	4.27	4.27	8.54	-----	Middaugh & Shannon.	do.....	June 29, 1901
85.00	61.08	61.09	122.17	\$23.91	John Sherman...	Thomas.....	Oct. 19, 1900
			1,614.75			(3)	
95.00	82.89	82.89	165.78	12.11	Saml. Ross.....	Prince.....	July 28, 1900
450.00	257.00	257.01	514.01	(4)	H. N. Taplin.....	do.....	Sept. 1, 1900
39.00	38.52	38.52	77.04	.48	do.....	Thomas.....	Nov. 15, 1900
55.00	40.50	40.50	81.00	14.50	Jno. F. Forsyth...	Ward.....	Jan. 10, 1901
* 47.20	36.44	36.45	72.89	10.75	E. L. McClelland	do.....	July 25, 1900
160.00	157.64	157.64	315.28	2.36	A. B. Mullett & Co.	do.....	Mar. 25, 1901
32.50	24.66	24.67	49.33	7.83	John Sherman...	do.....	July 24, 1900
8.00	6.73	6.73	13.46	1.27	Richd. C. Gill...	Prince.....	Aug. 25, 1900
(*)	104.66	104.66	209.32	88.33	H. N. Taplin.....	do.....	Sept. 5, 1900
90.00	90.00	90.00	180.00	-----	do.....	Thomas.....	Nov. 14, 1900
500.00	306.21	306.22	612.43	(*)	E. G. Stellwagen	Ward.....	Apr. 17, 1901
(*)	283.01	283.00	566.01	(10)	do.....	do.....	Dec. 15, 1900
(12)	200.04	200.05	400.09	140.73	do.....	do.....	Dec. 7, 1900
95.00	63.18	63.17	136.35	31.83	F. A. Blundon...	Prince.....	Apr. 19, 1901
			56.69	-----		Lanigan.....	Feb. 25, 1901
30.00	25.22	25.22	50.44	4.78	Sunderland Bros	Prince.....	May 1, 1901
18.00	12.08	12.09	24.17	5.91	H. Adams.....	Ward.....	June 4, 1901
20.00	17.07	17.07	34.14	2.93	Wm. Dudley, trustee.	Thomas.....	June 18, 1901
185.00	130.35	130.34	290.69	54.00	F. R. Sale.....	Ward.....	June 23, 1901
381.50	381.50	381.50	763.00	-----	T. H. Pickford...	do.....	Feb. 23, 1901
3,440.00	2,617.92	2,617.92	5,235.84	822.08	Geo. Truesdell...	Mackey <sup>13</sup> ....	Sept. 15, 1900
17.00	13.42	13.42	26.84	3.58	Nolan & Sons....	Prince.....	Sept. 25, 1900
14.00	9.54	9.54	19.08	4.46	John H. Walter...	do.....	Nov. 19, 1900
100.00	65.37	65.37	130.74	34.63	Vernon Bailey...	Thomas.....	Apr. 29, 1901
12.00	8.31	8.31	16.62	3.69	Jno. H. Walter...	Prince.....	Nov. 19, 1900
115.00	90.15	90.16	180.31	24.84	Mrs. J. M. Patten.	Ward.....	June 26, 1901
289.00	270.73	270.73	541.46	18.27	The Capital Traction Co.	do.....	May 2, 1901
365.00	** 426.40	365.00	** 791.40	-----	Thos. Gordon....	Prince.....	July 31, 1900
105.00	86.69	86.70	173.39	18.30	Jas. E. Jenkins...	Lanigan.....	<sup>13</sup> July 2, 1901
35.00	33.20	33.21	66.41	1.79	Jacob F. Raub....	Prince.....	Aug. 10, 1900
215.00	181.15	181.15	392.30	33.85	Ray E. Middaugh	Thomas.....	Mar. 19, 1901

\* Balance brought from job 26.

<sup>10</sup> Balance carried to job 28.

<sup>11</sup> Balance brought from job 27.

<sup>12</sup> Basin constructed upon request of computing engineer in connection with surface work.

<sup>13</sup> Constructed under contract 2776, by Peyton D. Vinson.

<sup>14</sup> Includes \$61.40 charged to the appropriation for "Main and pipe sewers," 1901.

<sup>15</sup> Repairs to pavements made in fiscal year 1902.

TABLE 2.—Statement of sewers laid under the appropriation for assessment and

VOLUNTARY

No. of order.	Location.	Pipe sewers laid (length in feet).						Manholes.	Basins.	Branches.
		8-inch.	10-inch.	12-inch.	15-inch.	18-inch.	24-inch.			
30	New Jersey avenue SE., from south side K street northward.	-----	-----	98	-----	-----	-----	-----	-----	1
35	North Capitol, between Randolph and S streets.	-----	-----	91	-----	-----	-----	-----	-----	5
42	North Capitol, between H and De-frees.	51	-----	-----	-----	-----	-----	-----	-----	3
56	Square 909	-----	148	-----	-----	-----	-----	1	-----	2
58	North side North Carolina avenue SE., between Seventh and Eighth streets.	-----	-----	26	-----	-----	-----	-----	-----	1
66	North Capitol street NW., between Seaton and T streets.	-----	-----	100	-----	-----	-----	1	-----	5
53	O street NW., between North Capitol and First streets.	-----	-----	233	-----	-----	-----	1	-----	1
65	P street NW., between Eleventh and Twelfth streets.	-----	108	-----	-----	-----	-----	1	-----	6
49	Quincy street NE., from Third street westward.	-----	-----	258	-----	-----	-----	-----	-----	-----
37	R street NW., between North Capitol and First streets.	-----	68	-----	-----	-----	-----	-----	-----	4
18	Sheridan street NW., from Piney Branch road eastward.	-----	121	-----	-----	-----	-----	-----	-----	5
38	Sixth street SW., between Maryland and Maine avenues, and Maine avenue, between Four-and-a-half and Sixth.	-----	201	-----	-----	-----	-----	1	-----	6
64	Square 672	-----	31	-----	-----	-----	-----	-----	-----	2
3	Thirty-fourth street, from Newark street northward.	55	-----	-----	-----	-----	-----	-----	-----	2
6	Thirty-sixth street NW., between O and P streets.	-----	116	-----	-----	-----	-----	-----	-----	4
9	Square 1010	-----	-----	62	-----	-----	-----	-----	-----	4
21	Square 293	35	-----	-----	-----	-----	-----	-----	-----	4
23	Square 378	-----	-----	80	-----	-----	-----	-----	-----	4
31	Thirty-sixth street NW., between Woodley road and Pierrepont, and Pierrepont, from Thirty-sixth street westward.	544	-----	-----	-----	-----	-----	2	-----	14
44	East curb Twenty-fifth and west curb New Hampshire avenue.	-----	84	-----	-----	-----	-----	1	-----	-----
45	East curb Twenty-sixth and west curb New Hampshire avenue.	-----	63	-----	-----	-----	-----	1	-----	-----
46	East curb Twenty-fifth street and east curb New Hampshire avenue.	-----	15	-----	-----	-----	-----	1	-----	-----
47	Twenty-second street NW., between M and N streets.	-----	-----	20	-----	-----	-----	-----	-----	1
50	Square 1010	-----	-----	114	-----	-----	-----	1	-----	-----
52	Thirteenth street NE., between G street and Maryland avenue.	-----	87	-----	-----	-----	-----	1	-----	3
60	Thirty-sixth street NW., between Pierrepont and Milwaukee.	203	-----	-----	-----	-----	-----	1	-----	4
68	Third street NE., between East Capitol and A streets.	-----	-----	55	-----	-----	-----	-----	-----	2
4	Virginia avenue SE., between Second and Third streets.	-----	-----	176	-----	-----	-----	1	-----	4
20	North side Virginia avenue NW., from Twenty-third street eastward.	-----	-----	41	-----	-----	-----	-----	-----	1
29	Vernon street NW., between Eighteenth and Nineteenth streets.	-----	42	-----	-----	-----	-----	-----	-----	3
43	South curb Virginia avenue and east curb Twenty-fifth street NW.	-----	87	-----	-----	-----	-----	-----	1	-----
10	Block 7, Washington Heights	-----	-----	336	-----	-----	-----	1	-----	6
32	W street NE., from west side Fourth street westward.	-----	38	-----	-----	-----	-----	-----	-----	1
Total.....		1,364	4,921.9	6,007.2	816	307	180	57	5	253

<sup>1</sup> Balance carried to job 36.<sup>2</sup> Awaiting bill for repairs to pavements.

OPERATIONS OF THE ENGINEER DEPARTMENT, D. C. 119

Permit work, and whole cost to applicant, for fiscal year 1901—Continued.

SYSTEM.

Amount of deposit.	Cost to District of Columbia.	Cost to applicant.	Total cost.	Amount returned.	For whom done.	Overseer.	Date of completion.
\$80.00	\$70.59	\$70.59	\$141.18	\$9.41	Washington Fertilizer Co.	Thomas .....	Apr. 1, 1901
82.50	73.49	73.48	146.97	(1)	Ray E. Middaugh	Ward .....	Apr. 9, 1901
30.00	26.37	26.38	52.75	3.62	C. V. Sparrow	Lanigan .....	Mar. 11, 1901
115.00	80.02	80.03	190.05	34.97	The Potomac Insurance Co.	do .....	May 21, 1901
20.00	16.61	16.60	33.21	3.40	Jas. D. Darnall	do .....	June 1, 1901
90.00	(2)	-----	-----	-----	Middaugh & Shannon.	Ward .....	(2)
195.00	145.45	145.45	290.90	49.55	Washington Sanitary Improvement Co.	Prince .....	Apr. 30, 1901
92.00	81.33	81.23	162.66	10.67	A. P. Clarke, Jr.	Condon .....	July 10, 1901
220.00	140.65	140.65	281.30	79.35	Washington Sanitary Improvement Co.	Lanigan .....	Apr. 13, 1901
65.00	55.46	55.46	110.92	9.54	Ray E. Middaugh	Ward .....	Mar. 22, 1901
90.00	90.00	90.00	180.00	-----	Kennedy & Davis	Thomas .....	Oct. 23, 1900
144.00	115.29	115.30	230.59	28.70	Jas. W. Tyler	do .....	May 6, 1901
26.71	26.70	26.71	53.41	-----	The Chapin-Sacks Co.	do .....	June 14, 1901
32.50	28.16	28.16	56.32	4.84	John Sherman	Ward .....	July 22, 1900
84.00	75.50	75.50	151.00	8.50	Jno. J. Horrigan	Thomas .....	July 25, 1900
51.00	41.87	41.87	83.74	9.13	S. Carr	Prince .....	Aug. 13, 1900
25.00	15.11	15.12	30.23	9.88	F. W. Graham	Thomas .....	Nov. 9, 1900
85.00	50.22	50.22	100.44	34.78	Gasch Bros.	Prince .....	Dec. 21, 1900
389.00	295.00	295.00	580.00	94.00	Thos. J. Fisher & Co.	do .....	Dec. 19, 1900
-----	58.81	*58.82	117.63	-----	Capital Traction Co.	Lanigan .....	Apr. 18, 1901
-----	52.08	*52.08	104.16	-----	do .....	do .....	Apr. 22, 1901
-----	33.01	*33.00	66.01	-----	do .....	do .....	Apr. 17, 1901
18.00	13.25	13.25	26.50	4.75	E. L. McClelland	Prince .....	Apr. 27, 1901
101.50	79.57	79.57	159.14	21.93	Richard Knight	Ward .....	Apr. 10, 1901
80.00	55.50	55.51	111.01	24.49	S. Carr	Prince .....	May 2, 1901
140.00	112.88	112.88	225.76	27.12	J. N. Baker	Lanigan .....	June 24, 1901
44.00	(2)	-----	-----	-----	Mrs. Garland	Ward .....	(2)
130.00	130.00	130.00	260.00	-----	C. F. Norment	Prince .....	Aug. 4, 1900
32.00	29.48	29.47	58.95	2.53	W. F. Davidson	Thomas .....	Oct. 27, 1900
42.00	42.00	42.00	84.00	-----	Bates Warren	do .....	Mar. 16, 1901
-----	46.91	*46.91	93.82	-----	Capital Traction Co.	Lanigan .....	Apr. 4, 1901
251.00	213.88	213.88	427.76	67.12	John H. Nolan	Ward .....	Aug. 13, 1900
30.00	20.21	20.21	40.42	9.79	E. F. Kennedy	Lanigan .....	Dec. 28, 1900
10,333.41	8,600.34	8,539.05	18,810.83	1,914.72			

\* Chargeable to the general deposit of the Capital Traction Co.

TABLE 3.—Statement of sewers laid under the appropriation for assessment

ASSESSMENT

No. of order.	Location.	Pipe sewers laid (length in feet).				
		8-inch.	10-inch.	12-inch.	15-inch.	18-inch.
132	Block 7, Bloomingdale.....				206.5	
164	do.....			25	75	
165	do.....			256		
172	Blair road, between Vermillion street and Chestnut avenue.....		695			
129	Brightwood avenue, between Quincy and Philadelphia streets.....			391		
143	Champlain avenue, from Superior street northward.....			467.5		
144	do.....		261.5			
175	Chestnut avenue, between Blair road and Baltimore and Ohio R. R.....	600				
178	Chestnut avenue, from Baltimore and Ohio R. R. eastward.....	227.5				
100	Connecticut avenue, between Klinge Ford road and Newark street.....			608.1		
181	Carroll avenue, between Maple avenue and Baltimore and Ohio R. R.....					
113	South side D street NE., between Ninth and Tenth streets.....			220		
114	North side D street NE., between Ninth and Tenth streets.....			224		
154	North side D street NW., between Nineteenth and Twentieth streets.....			331.5		
157	South side D street NW., between Eighteenth and Nineteenth streets.....			376		
158	North side D street NW., between Eighteenth and Nineteenth streets.....			376		
117	Eighth street NW., between Savannah and Trenton streets.....		70	397		
140	Erie street NW., between Ontario and Champlain avenues.....			221		
159	East Capitol street SE., between Fourteenth and Fifteenth streets.....		172.5			
160	do.....			275.5		
162	Eighteenth street NW., between D street and Virginia avenue.....			442		
105	F street NE., between Third and Fourth streets.....			322		
106	First street NW., between N street and New York avenue.....			250		
109	Fifth street NE., between E and F streets.....			340		
118	Alley, between Fillmore and Polk and Arthur and Jefferson.....		165			
120	Flint street NW., between Eighth and Ninth streets.....	430				
125	Flint street NW., between Fifth and Seventh streets.....		690.1			
126	Flint street NW., between Seventh and Eighth streets.....	429.9				
137	Square 514.....			121		
149	Fifth street SE., between Virginia avenue and G street.....			355		
180	First and K streets NE., (northeast corner).....			3		
169	Georgia avenue SE., between Twelfth and Thirteenth streets.....		138	36		
173	Georgia avenue and Tenth street SE.....					
121	Harrison street, between Minnesota and Adams streets.....			389		
123	Harrison street, between Adams and Sixteenth streets.....		331			
127	Harrison street, from Sixteenth street eastward.....		610			
131	H street SW., between Water and Ninth streets.....		200			
138	H street NE., between Thirteenth and Fourteenth streets.....		283.5			
151	H street SW., between Half and First streets.....			339		
153	Half street SE., between M and N streets.....			290		
155	H street SW., between Half and First streets.....		202			
145	I street SW., between Seventh and Eighth streets.....			125		
112	Northeast corner Kentucky avenue and E street SE.....					

<sup>1</sup> Work completed in fiscal year 1902.<sup>2</sup> Includes cost of pavements repaired in fiscal year 1902.

# OPERATIONS OF THE ENGINEER DEPARTMENT, D. C. 121

permit work, and whole cost to applicant, for fiscal year 1901.

EM.

is st-	Manholes.	Branches.	Cost to District of Columbia.	Cost to property owner.	Total cost.	Overseer.	Date of com- pletion.
		3	\$114.82	\$114.82	\$229.64	Thomas	Nov. 28, 1900
	1	3	84.25	84.25	168.50	Prince	May 2, 1901
	1	3	166.66	166.67	333.33	do	May 6, 1901
	12	13	406.60	406.60	813.20	do	June 5, 1901
	3	1	345.02	345.02	690.04	Ward	Jan. 22, 1901
	3	9	344.21	344.22	688.43	Prince	Apr. 30, 1901
	12	15	197.30	197.30	394.60	do	Do.
	12	15	264.58	264.58	529.16	do	June 10, 1901
	1	5	115.92	115.92	231.84	do	June 14, 1901
	4	1	440.22	440.22	880.44	Ward	July 16, 1900
			8.48	8.48	16.96	Prince	( <sup>1</sup> )
	1		131.75	131.76	263.51	do	Sept. 7, 1900
	1	1	143.64	143.63	287.27	do	Oct. 22, 1900
	2	2	209.48	209.48	418.96	do	Apr. 1, 1901
	2		220.51	220.52	441.03	do	Apr. 8, 1901
	2	1	206.63	206.64	413.27	do	Apr. 12, 1901
	2	2	296.63	296.63	593.26	Ward	Sept. 19, 1900
	1	6	143.14	143.15	286.29	Prince	Jan. 15, 1901
	1	10	104.59	104.58	209.17	Ward	Apr. 18, 1901
	1	1	167.08	167.08	<sup>2</sup> 334.16	do	July 5, 1901
	2		297.07	297.07	594.14	Prince	Apr. 23, 1901
	2	5	206.15	206.15	412.30	do	Aug. 20, 1900
	1		206.11	206.10	412.21	Thomas	Aug. 23, 1900
	12		254.70	254.70	509.40	Prince	Sept. 27, 1900
	1	7	121.38	121.37	242.75	do	Sept. 20, 1900
	12	16	279.92	279.92	559.84	Ward	Sept. 25, 1900
	12	24	396.17	396.17	792.34	do	Nov. 2, 1900
	2	16	204.97	204.98	409.95	do	Nov. 6, 1900
	2	7	120.52	120.52	241.04	Thomas	Apr. 1, 1901
	1	6	225.42	225.42	450.84	Prince	June 3, 1901
1					52.72	Lanigan	<sup>2</sup> June 27, 1901
	2	8	121.00	121.01	242.01	Ward	May 10, 1901
	( <sup>4</sup> )				6.66	Lanigan	<sup>2</sup> May 16, 1901
	2	9	389.45	389.46	778.91	Prince	Nov. 27, 1900
	1	24	300.07	300.07	600.14	do	Oct. 23, 1900
	3	46	506.31	506.31	1,012.62	do	Nov. 9, 1900
	1	5	157.96	157.96	315.92	Ward	June 5, 1901
	2	3	261.21	261.22	522.43	Thomas	Mar. 30, 1901
	1		160.39	160.39	320.78	Lanigan	Mar. 28, 1901
	1		153.72	153.73	307.45	Ward	Mar. 31, 1901
	1	11	96.34	96.34	192.68	Lanigan	May 8, 1901
	1	4	91.90	91.91	183.81	Ward	Mar. 11, 1901
1					43.93	Lanigan	<sup>2</sup> Sept. 29, 1900

<sup>2</sup> Work performed at request of surface department.

<sup>4</sup> One manhole adjusted.

## 122 OPERATIONS OF THE ENGINEER DEPARTMENT, D. C.

TABLE 1.—*Work done and work authorized under the appropriation for assessment*

ASSESSMENT

No.	Location	Pipe sewers laid length in feet			
		4-inch	6-inch	12-inch	15-inch
10	King street NE, between Bladenburg road and Third street		12.4		
11	Long street, between Trinidad street and Bladenburg road		135		
12	Long street SE, between Half and South Capitol streets			191	
13	Long street SE, between Half and First streets			291	
14	Long street SE, between Half and First streets			291	
15	Long street SE, between Thirteenth and Fourteenth streets				291
16	Massachusetts Avenue, from Sheridan circle westward			167	
17	Maple Avenue, between Nichols Avenue and Third street		36		
18	Maple Avenue, between Spring and High streets	47	43	25	
19	Maple Avenue, between Baltimore and Ohio R. R. and Carroll Avenue		32		
20	Q street NW, between Twenty-eighth and Twenty-ninth streets, north side				
21	Q street NW, between Twenty-eighth and Twenty-ninth streets, south side				
22	Newark street NW, from Connecticut Avenue westward	621			
23	Navy place, square 29			295	
24	New York Avenue NW, between Twenty-first and Twenty-second streets			291	
25	New York Avenue NW, between Twenty-second and Twenty-third streets			332	
26	New York Avenue NW, between Virginia Avenue and Twentieth street			195	
27	Northeast corner Nineteenth and Q streets NW				6
28	N street NW, between Nineteenth and Twentieth street NW	46			
29	New York Avenue NW, between Nineteenth and Twentieth streets			255	
30	New York Avenue NW, between Fourteenth and Fifteenth streets			339	
31	Piney Branch Road, between Vermilion and Umattla streets		391		
32	Philadelphia street, between Brightwood Avenue and Eighth street		274.5		
33	Pennsylvania Avenue SE, between Fourteenth and Fifteenth streets			450	
34	Northwest corner Pennsylvania Avenue and Jackson place				
35	Quincy street NE, between Frankfort and Hartford streets			23	
36	S street NW, between First and Second streets		222	218	
37	Shannon place from Navy place southward			430	
38	Second street SW, between C and D streets	15.5			
39	Square 29	55	100.4	294	
40	South side Sheridan circle from Twenty-third street westward			112	
41	Twelfth street NE, between Providence and Lansing streets		151		
42	Trinidad street NE, from Lewis street southward		136.5	18	
43	Trinidad street NE, from King street northward			257	
44	Square 21		140		
45	Twelfth street SE, between D and E streets		64		
46	Wallace street, between Frankfort and Hartford streets		142		
Total		2,831.9	6,948.4	11,657.6	6,375

1 Awaiting bill for repairs to pavements.

2 One manhole adjusted.

3 Sewer constructed in fiscal year 1900.

# OPERATIONS OF THE ENGINEER DEPARTMENT, D. C. 123

work, and whole cost to applicant, for fiscal year 1901—Continued.

L

Manholes.	Branches.	Cost to District of Columbia.	Cost to property owner.	Total cost.	Overseer.	Date of completion.
1	13	\$62.12	\$62.11	\$124.23	Prince .....	Mar. 1, 1901
1	7	82.93	82.94	165.87	do .....	Feb. 27, 1901
1	2	139.62	139.62	279.24	Ward .....	Jan. 14, 1901
1	.....	148.67	148.67	297.34	do .....	Mar. 16, 1901
1	.....	142.77	142.76	285.53	do .....	Apr. 1, 1901
1	16	399.18	399.18	798.36	do .....	May 7, 1901
.....	7	118.11	118.12	236.23	Thomas .....	July 31, 1900
1	9	141.93	141.93	283.86	Ward .....	June 5, 1901
4	41	.....	.....	( <sup>1</sup> )	.....	( <sup>2</sup> )
2	15	301.25	301.26	602.51	Prince .....	June 23, 1901
2	.....	42.98	42.98	85.96	Thomas .....	<sup>3</sup> July 27, 1900
.....	.....	10.75	10.75	21.50	do .....	<sup>3</sup> July 20, 1900
2	26	513.80	513.80	1,027.60	Ward .....	Aug. 8, 1900
1	.....	325.72	325.72	651.44	do .....	<sup>4</sup> Aug. 24, 1900
1	2	186.84	186.84	373.68	do .....	Aug. 30, 1900
.....	2	323.80	323.80	647.60	do .....	Sept. 8, 1900
1	4	122.29	122.29	244.58	do .....	Sept. 11, 1900
.....	.....	.....	.....	51.23	Lanigan .....	<sup>5</sup> Oct. 3, 1900
1	3	40.96	40.95	81.91	do .....	Jan. 16, 1901
2	7	162.83	162.83	325.66	Prince .....	Mar. 26, 1901
1	7	264.43	264.43	528.86	do .....	June 19, 1901
1	8	225.25	225.25	450.50	Lanigan .....	June 15, 1901
1	10	208.31	208.31	416.62	Ward .....	Nov. 23, 1900
2	7	316.58	316.59	633.17	do .....	June 5, 1901
.....	.....	.....	.....	59.93	Lanigan .....	<sup>5</sup> May 3, 1901
2	5	220.25	220.25	440.50	Prince .....	Mar. 13, 1901
2	13	219.24	219.25	438.49	do .....	Oct. 15, 1900
2	15	290.16	290.16	580.32	do .....	Oct. 1, 1900
.....	2	7.51	7.51	15.02	Ward .....	Feb. 26, 1901
3	19	344.20	344.21	688.41	Thomas .....	Mar. 19, 1901
1	1	95.27	95.27	190.54	Lanigan .....	May 20, 1901
1	4	102.76	102.77	205.53	Prince .....	<sup>4</sup> July 5, 1900
2	10	103.10	103.10	206.20	do .....	Feb. 26, 1901
2	5	164.52	164.52	329.04	do .....	Mar. 7, 1901
1	9	93.62	93.62	187.24	Lanigan .....	Jan. 12, 1901
.....	3	39.79	39.79	79.58	do .....	Mar. 7, 1901
1	3	101.53	101.53	203.06	do .....	May 3, 1901
109	557	14,725.34	14,725.46	29,665.27		

<sup>1</sup> The excessive cost of this work is due to the large amount of rock excavation.

<sup>2</sup> Work performed at request of surface department.

<sup>3</sup> Work begun in fiscal year 1900.

TABLE 4.

No. of order.	Location.	Pipe sewers laid (length in feet).			Manholes.	Bustns.	Branches.
		8-in.	12-in.	24-in.			
301	Square 859.....	29					1
302	E street NW., between Thirteenth and Thirteenth and a half streets.				1		
306	Eleventh and E streets NW.....				1		
311	First and C streets NE. (southeast corner).....		6			1	
307	G and Twenty-sixth streets NW. (intersection).....				1		
303	Massachusetts avenue, near Twenty-second street NW. <sup>1</sup>						
304	Pennsylvania avenue NW., between Fourteenth and Fifteenth streets.			168			
305	Pennsylvania avenue SE., between Tenth and Eleventh streets.				1		
310	N and S, alleys in Padsworth.....				1		
300	Rhode Island avenue, between Metropolitan Branch Baltimore and Ohio R. R. and Ninth street NE.			18		2	
308	Twenty-fifth street NW., between H and I streets				3		
	Total .....	29	6	186	8	3	1

<sup>1</sup> Paid out of general deposit.

# OPERATIONS OF THE ENGINEER DEPARTMENT, D. C. 125

hole cost.

Amount of deposit.	Total cost.	Amount returned.	For whom done.	Overseer.	Date of completion.
\$45.00	\$33.87	\$11.13	Matilda Wilkins .....	Prince .....	Sept. 25, 1900
25.00	24.69	.81	F. S. Gannon, third vice-pres- ident.	Lanigan .....	Do.
(1)	31.87	.....	Anacostia and Potomac R. R....	do .....	Dec. 23, 1900
(1)	57.75	.....	Capital Traction Co .....	do .....	Apr. 30, 1901
(1)	27.34	.....	do .....	do .....	Dec. 15, 1900
20.00	16.09	3.91	C. F. Grieshaber .....	do .....	Sept. 25, 1900
740.14	740.14	.....	Bernard R. Green .....	Thomas .....	Mar. 2, 1901
(1)	34.05	.....	Capital Traction Co .....	Lanigan .....	Nov. 24, 1900
35.00	33.17	1.83	A. Loeffler .....	do .....	June 7, 1901
170.00	161.68	8.32	City and Suburban Rwy. Co .....	do .....	July 7, 1900
(1)	143.86	.....	Capital Traction Co .....	do .....	Mar. 20, 1901
1,065.14	1,304.51	25.50			

\* Artificial basin top replaced by bluestone top.

TABLE

No. of order.	Location.	Pipe sewers laid (length in feet).			Manholes.	Basins.
		8-in.	12-in.	24-in.		
301	Square 859.....	20				
302	E street NW., between Thirteenth and Thirteenth and a half streets.....				1	
306	Eleventh and E streets NW.....				1	
311	First and C streets NE. (southeast corner).....		6			1
307	G and Twenty-sixth streets NW. (intersection).....				1	
303	Massachusetts avenue, near Twenty-second street NW. <sup>1</sup> .....					
304	Pennsylvania avenue NW., between Fourteenth and Fifteenth streets.....			168		
305	Pennsylvania avenue SE., between Tenth and Eleventh streets.....				1	
310	N and S. alleys in Padsworth.....				1	
300	Rhode Island avenue, between Metropolitan Branch Baltimore and Ohio R. R. and Ninth street NE.....			18		2
308	Twenty-fifth street NW., between H and I streets.....				3	
	Total.....	20	6	186	8	3

<sup>1</sup> Paid out of general deposit.

# OPERATIONS OF THE ENGINEER DEPARTMENT, D. C. 125

cost.

int osit.	Total cost.	Amount returned.	For whom done.	Overseer.	Date of completion.
5.00	\$33.87	\$11.13	Matilda Wilkins .....	Prince .....	Sept. 25, 1900
5.00	24.69	.31	F. S. Gannon, third vice-presi- dent.	Lanigan .....	Do.
	31.87	-----	Anacostia and Potomac R. R. ....	do .....	Dec. 23, 1900
	57.75	-----	Capital Traction Co .....	do .....	Apr. 30, 1901
	27.34	-----	do .....	do .....	Dec. 15, 1900
1.00	16.09	3.91	C. F. Grieshaber .....	do .....	Sept. 25, 1900
1.14	740.14	-----	Bernard R. Green .....	Thomas .....	Mar. 2, 1901
	34.06	-----	Capital Traction Co .....	Lanigan .....	Nov. 24, 1900
5.00	33.17	1.83	A. Loeffler .....	do .....	June 7, 1901
1.00	161.68	8.32	City and Suburban Rwy. Co .....	do .....	July 7, 1900
	143.86	-----	Capital Traction Co .....	do .....	Mar. 20, 1901
5.14	1,304.51	25.50			

\* Artificial basin top replaced by bluestone top.

TABLE 5.—*Work done by day labor*

## REPLACING OBSTRUCTED SEWERS.

Number of order.	Location.	Pipe sewers laid (length in feet)			
		6-inch.	10-inch.	12-inch.	15-inch.
402	D street NW., between Seventh and Eighth streets	(*)		30	
406	Eleventh street NW., between K street and Vermont avenue	63		136	
420	Square 870	66		158	
400	Four-and-a-half street SW., between H and I streets	6		306	
415	F street NW., between Second and Third streets	69		322	
401	K street SW., between Sixth and Seventh streets	60			50
404	O street NW., between Fourth and Sixth streets	30			
421	New Jersey avenue SE., between E and Ivy streets	6		175	
407	Prospect street NW., from Potomac eastward	39	306		
414	P street NW., between Fifteenth and Sixteenth streets	135			
409	Rhode Island avenue, between Twelfth street and Vermont avenue	12		201	
408	Rhode Island avenue, between Twelfth street and Vermont avenue	9			8
411	Rhode Island avenue, between Fifth street and New Jersey avenue	15		86	
403	Sixth street SW., between K and L streets	30		271	
407	Twelfth street NW., crossing Rhode Island avenue				
412	Square 367	45			28
413	do	63		32	
416	Thirteenth street SW., between B and D streets	39			37
419	Square 342	3		120	
422	Third street SE., between M and N streets	45		206	4
410	Vermont avenue from Iowa circle northward	9	97		
	Total	744	402	2,073	1,38

\* The net cost is determined by deducting the cost of repairs to pavements and cost of connections from the total cost.

\* Six-inch pipe used in making house connections.

\* Repairs to pavements were made in fiscal year 1902.

\* Includes \$2.94 cost of work by plumber.

us sewer appropriations, fiscal year 1901.

REPLACING OBSTRUCTED SEWERS.

	Connections made.	Manholes.	Branches.	Cost of materials.	Cost of labor.	Cost of repairs to pavements.	Total cost.	Cost of connections.	Net cost of sewer. <sup>1</sup>
f.			1	\$13.73	\$25.51	\$7.17	\$46.41		\$39.24
		1	11	94.94	409.23		504.17	\$42.66	461.51
8			16	88.92	381.68	<sup>2</sup> 14.99	485.59		470.60
8		3	15	174.04	<sup>4</sup> 489.21	147.52	810.77	29.94	633.31
8		3	19	203.95	<sup>5</sup> 353.65		( <sup>6</sup> )	10.22	547.38
	16	3	19	309.22	640.73	40.93	990.88	33.13	916.82
	7	2	8	290.07	<sup>7</sup> 713.60	38.99	1,042.66	36.41	967.26
		1	5	81.45	321.68		403.13	( <sup>8</sup> )	403.13
6	8	2	13	133.54	441.47	22.42	597.43	23.01	552.00
				17.33	<sup>9</sup> 125.03	6.09	148.45		142.36
6		1	9	96.24	413.04		509.28		509.28
		2	3	116.45	314.02	33.34	463.81		430.47
	4	1	8	80.40	321.29		401.69		401.69
9	13	2	11	141.59	323.67	13.34	478.60	28.73	436.53
85		1		69.31	187.21	21.58	278.10		256.52
2	19	12	19	212.77	537.70	90.19	840.66	35.75	714.72
8	19	12	16	89.12	312.28	38.17	439.57	37.56	363.84
	14	12	19	247.11	756.79	22.92	1,026.82		1,003.90
	1	6	6	82.94	246.51	47.24	376.69		329.45
	9	3	7	167.74	540.53		( <sup>8</sup> )		708.27
4	4		5	34.35	195.27		229.62	17.13	212.49
75	114	33	210	2,745.21	8,060.10	544.89	10,174.33	294.54	10,500.77

<sup>1</sup> Includes \$10.22 cost of work by plumber.

<sup>2</sup> Awaiting bill for repairs to pavements.

<sup>3</sup> Includes \$2.59 cost of work by plumber.

<sup>4</sup> Work completed fiscal year 1902.

<sup>5</sup> Includes \$15.07 cost of work by plumber.

TABLE 6.—Main

Number of order	Location.	Pipe sewers laid (length in feet).			
		6-inch.	8-inch.	10-inch.	12-inch.
544	Canal-street property yard				
536	Bladensburg road at north curb line, N street				
521	Brightwood avenue, between Florida avenue and Pome-roy street			3	
534	Centre and Fourteenth streets NW. (southwest corner)				
587	Cincinnati street NW., just east of Twentieth street				3
603	Canal and South Capitol streets (northwest corner)				12
651	Canal-street property yard				
621	Connecticut avenue and S street NW. (southwest and southeast corners)				
503	Delaware avenue SW., between L and M streets (crossing)				
507	Delaware avenue and F street (northeast corner) and First and F streets (southwest corner)				
511	Delaware avenue SW., between M and N streets				
514	Delaware avenue and M street SW. (northwest corner)				3
515	Delaware avenue SW., between M and N streets				42
539	Dartmouth and Eleventh streets NW. (northwest corner)				53
512	Eighth and L streets NE. (northeast corner)				15
558	Eighteenth street and Howard avenue (northwest corner)				24
560	Eighteenth and H streets NW. (southeast corner)				
562	Eighth and E streets NE. (southeast corner)				
563	Eighth and F streets NE. (southwest corner)				
574	Eighteenth and C streets NW. (northwest corner)				
585	Eleventh street SE., at Virginia avenue		66		
591	Eighteenth street and Kenesaw avenue				
594	Eighteenth street NW., just north of Columbia road			29	
612	Eighteenth street and Howard avenue NW.				
623	Eighteenth street and Florida avenue NW. (southwest corner)				
626	Eslin and Lamar streets NW. (southwest and southeast corners)				42
637	Eighth street SW., between I and K streets				
508	Fifth and L streets NE. (northeast corner)				15
509	Fourth and L streets NE. (northeast corner)				6
520	First and O streets NE. (northwest corner)				9
535	First and V streets NW. (southeast corner)				15
547	First and L streets SE. (northeast corner)				42
549	First and L streets SE. (northwest and southwest corners)			78	
551	Fourteenth and G streets NW. (southwest corner)				60
556	First and I streets SW. (southeast corner)				
561	Fifth street NE., between I and K streets			21	
564	Fifth and F streets NE. (southwest corner)				
583	Florida avenue and right of way of B. & O. R. R. (northwest corner)				
503	Fourteenth and Binney streets			9	
602	Square 514				113
609	Flagler place NW., between U and W streets			111	
617	Fourth and W streets NE. (northeast and northwest corners)				8
620	Fifteenth and D streets SE. (northwest and northeast corners)			60	
622	Florida and California avenues NW. (northwest corner)				
624	Florida avenue and Seventeenth street NW. (southeast corner)				
625	Florida avenue, 100 feet west of Sixteenth street NW.				
628	Fourteenth street NW., between G street and New York avenue				
629	Florida and New Hampshire avenues NW. (southwest corner)				
630	Florida avenue and S street NW. (southeast corner)				
633	Florida and Ontario avenues NW. (northwest corner)				
638	Fifth street SE., from Virginia avenue northward				137
641	Florida avenue, just east of Washington Branch B. & O. R. R.				
660	Fourteenth street NW., between G street and New York avenue				
661	Fifteenth and B streets NE. (southwest corner)				
662	Fifteenth and B streets NE. (southeast corner)				
627	G street, crossing Fourteenth street NW.				
658	G street and New Hampshire avenue NW. (northeast corner)				18

<sup>1</sup> Constructing artificial basin tops (51 corner and 82 side tops).

<sup>2</sup> Constructing shed for making and storing artificial basin tops. One half the cost of this work was charged to the appropriation for cleaning and repairing sewers and basins and repaid to the appropriation for main and pipe sewers.

sewers.

Sewers laid (length in feet).			Gutter inlet.	Manholes.	Basins.	Branches.	Cost of materials.	Cost of labor.	Cost of repairs to pavements.	Total cost.
18-inch.	21-inch.	24-inch.								
					1		\$340.01	\$281.20		<sup>1</sup> \$621.21
							28.96	27.77		56.73
					1		25.45	26.97		52.42
18					1		37.14	30.03		67.17
					1		38.15	41.91		80.06
					1		29.68	29.46		59.14
							93.18	20.06		<sup>2</sup> 113.24
					2		86.48	122.55	\$27.35	236.38
126							77.14	131.55		208.69
					2		67.63	66.77	3.84	138.24
315				1			201.84	270.65		472.49
					1		30.57	40.21		70.78
					2		54.11	62.18		116.29
					1		39.76	48.08		87.84
					1		31.01	34.35		65.36
					1		34.21	43.08		77.29
					1		35.16	45.11		80.27
					1		25.84	25.68	2.62	54.15
					1		33.99	38.15		72.14
					1		44.65	43.10		87.75
					2		11.35	40.88	2.10	54.33
					1		73.47	69.52		142.99
					1		51.59	53.33		104.92
					1		33.44	38.77		72.21
					1		31.15	30.16	1.53	62.84
					2		66.48	68.97		135.45
45				2		2	196.06	285.02	41.12	522.20
					1		29.71	36.45		66.16
					1		26.93	27.08	2.31	56.32
					1		28.26	26.79		55.05
					1		30.41	25.65		56.06
					1		37.03	40.69		77.72
					2		71.12	72.16		143.28
					1		44.99	61.57	13.68	120.24
					1		28.22	22.39		50.61
					1		31.50	25.97		57.47
					1		28.72	28.61	9.16	66.49
		39			1		63.83	77.20		141.03
					1		91.57	105.75	33.37	230.69
					1	4	59.28	204.70	18.43	282.41
					6		187.10	159.51		346.61
					2		54.29	47.10		101.39
					2		68.18	97.72		165.90
					1		48.15	59.99		108.14
					1		25.59	34.50		60.09
					1		27.43	35.87		63.30
						5	77.91	<sup>2</sup> 290.10	96.28	464.23
					1		34.72	36.81		71.53
					1		30.64	33.78	9.59	74.01
					1		46.73	63.38		110.11
				1			65.66	133.87	3.45	202.98
		51			2		101.31	89.79		191.10
					2		104.54	184.03	72.92	361.49
					1		33.29	26.44		59.73
					1		32.37	25.57		57.94
		39		1			68.09	145.62	21.75	235.46
					1		31.31	39.64		70.95

<sup>1</sup> Includes \$12.03, cost of work by plumber.

TABLE 6.—Main and pipe

Number of order.	Location.	Pipe sewers laid (length in feet).			
		6-inch.	8-inch.	10-inch.	12-inch.
554	Half and N streets SE. (northwest corner)				9
555	Half and H streets SW. (southeast and southwest corners)			69	15
557	Half and M streets SW. (southeast corner)				42
600	H street between Water and Ninth streets SW				66
643	Half street SW., from N street southward				
644	Half street SE., between M and N streets			134	
645	H street SW. between Half and First streets				42
559	Ingleside terrace between, Eighteenth and Nineteenth streets				39
604	Ivy street, just east of South Capital street.				
538	King and Trinidad streets NE. (northeast and northwest corners)				30
590	Kenesaw avenue at Seventeenth street NW				
657	K street and L'Enfant circle SE.				30
537	Levis and Trinidad streets NE. (northeast corner)				
552	L street and west roadway Canal street SE. (northeast corner)		38		
584	L street NE., between Ninth and Tenth streets				45
599	L street SE., between Eighth and Ninth streets				
611	L street SW., between Half street and James Creek Canal				
614	L street SW., between South Capitol and Half streets				
616	L street SE., between Half and South Capitol streets				51
618	do				
632	L street NW., between Twentieth and Twenty-first streets	48		139	200
639	L street SE., between Half and First streets			6	180
642	do				107
667	Le Droit avenue, between Seaton and Thomas streets				
533	M street NW., between Fourteenth and Fifteenth streets			78	
659	Michigan avenue at North Capitol street.			6	
540	Ninth and D streets NE. (northeast corner)				3
548	New Jersey avenue and L street SE. (northwest, southwest, and northeast corners)				27
565	Ninth and Quincy streets NW. (southeast corner)				60
575	Nineteenth and C streets NW. (northeast corner)				
576	Nineteenth and D streets NW. (northwest corner)				
588	Nineteenth street, just south of Cincinnati street.			72	18
596	Ninth and K streets NE. (northeast corner)				18
597	Ninth and K streets NE. (northwest corner)				18
619	N street NW., between Nineteenth and Twentieth streets				
631	Nineteenth street and Florida avenue NW. (southeast corner)		63		
665	Oak and Fourth streets NW. (northeast corner)				12
608	N street NW., between Seventeenth and Eighteenth streets)				
522	Pomeroy street and Brightwood avenue NW. (northeast corner)			12	
529	Pennsylvania avenue NW., between Sixth and Seventh streets				30
615	P street NW., from Twenty-third street westward				
646	Pennsylvania avenue SE. crossing Fifteenth street.				
654	South roadway of Pennsylvania avenue and Twelfth street SE. (northwest corner)			21	
655	Pennsylvania avenue and Twelfth street SE. (southwest corner)				
640	Q street NW., just east of First street.			18	
502	Crossing Rhode Island avenue and Seventeenth street (north and west sides)				85
532	Crossing Rhode Island avenue between Fifteenth and Sixteenth streets and square 195.				
601	Crossing Rhode Island avenue and R street, between Seventh and Marion and square 444.			3	31
610	R street NW., between Nineteenth and Twentieth streets	30			
647	R street NW., crossing Seventeenth street.				24
648	R street NW., between Sixteenth and Seventeenth streets				
649	R street NW., crossing Sixteenth street.				469
650	R street NW., between Fifteenth and Sixteenth streets.				
500	Seventeenth street NW., between M street and Rhode Island avenue.				
501	Second street SW., between L and M streets				
513	South Capitol and K streets SE. (northeast corner)			15	
517	S street NW., between Thirty-fourth and Thirty-fifth streets			21	

<sup>1</sup> Work completed in fiscal year 1902.<sup>2</sup> Awaiting bill for repairs to pavements.<sup>3</sup> Includes \$9.97, cost of work by plumber.

—Continued.

sewers laid (length in feet).			Gutter inlet.	Manholes.	Basins.	Branches.	Cost of materials.	Cost of labor.	Cost of repairs to pavements.	Total cost.
18-inch.	21-inch.	24-inch.								
					1		\$26.43	\$22.06		\$48.49
					2		67.61	65.38		132.99
					1		29.69	26.26		55.95
				1			30.21	46.77	\$9.44	86.42
				1			38.63	37.92		76.55
				1			103.44	178.72		282.16
				1		1	53.37	73.25	12.57	139.19
					1		39.48	42.81		82.29
					1		37.45	42.08		79.53
					2		65.70	51.58		117.28
					2		62.62	55.44		118.06
					1		38.75	28.29		67.04
					1		36.60	27.57		64.17
					1		25.48	31.72		57.20
		27			1		69.39	85.27		154.66
				1			37.95	60.29		98.24
		99		1		3	124.91	147.21		272.12
	381						316.93	488.03		804.96
210				1			142.66	267.51		410.17
				1			37.77	65.42	9.35	112.54
	30			3		23	230.62	547.96	54.41	832.99
						1	63.69	124.02	5.51	193.22
					1		39.19	62.44		101.63
					1		26.16	25.97		52.13
				1		3	37.21	82.80	7.63	127.64
					1		26.52	25.63		52.15
					1		24.60	28.15		52.75
					3		82.62	82.12		164.74
					1		45.76	40.80		86.56
					1		44.44	36.38		80.82
					1		45.09	56.07		101.16
					1		43.21	54.93		98.14
					1		32.67	28.06		60.73
					1		31.96	24.69		56.65
				1		3	32.67	49.28		81.95
					1		31.51	34.16		65.67
					1		30.58	27.75	( <sup>2</sup> )	
24							16.91	100.54		117.45
					1		29.27	31.47		60.74
					1		34.27	36.50	8.01	78.78
360				2		1	353.32	734.24	31.55	1,119.11
				1			53.80	71.99	4.87	130.66
					1		22.90	26.58		49.48
					1		30.46	33.12		63.58
					1		30.18	29.04		59.22
57	78			2			131.60	265.64	44.45	441.69
				1		2	87.91	322.97	82.19	493.07
96	30			4	1	12	297.39	610.15	70.77	978.31
221	113			3		5	300.22	633.65	9.49	943.36
		39		1			65.66	101.12	11.84	178.62
	460			2		8	430.75	872.72		1,303.47
90				1			72.28	167.19	25.76	265.23
				2		10	199.40	542.34	43.99	785.73
		352		1			269.23	492.95		762.18
	267			1			236.33	292.08	97	529.38
					1		29.00	26.48		55.48
					1		24.68	23.32		48.00

<sup>1</sup> Includes \$44.00, cost of work by plumber.

<sup>2</sup> Includes \$77.10, cost of work by plumber.

TABLE 6.—*Main and pipe*

Number of order.	Location.	Pipe sewers laid (length in feet).			
		6-inch.	8-inch.	10-inch.	12-inch.
519	Seventh and Acker streets NE. (southwest corner).....			15	
530	Seventh street and Louisiana avenue NW. (northeast and southeast corners).....			15	20
531	Seventh street and Pennsylvania avenue NW. (northeast corner).....	6			
545	South Capitol and L streets SE. (southeast corner).....				9
605	South Capitol and Canal streets (northeast corner).....				
613	S street NW., just west of Phelps place.....			39	
635	Second street SE., between I and K streets.....			81	
506	Sixth and E streets NE. (northeast corner).....				18
518	Sixth and Acker streets NE. (southeast corner).....				18
523	Sixth and Callan streets NE. (northeast corner).....			9	
524	Superior street and Champlain avenue (southeast corner).....				
525	Superior street and Ontario avenue (northeast corner).....				
526	Superior and Meridian streets (northwest corner).....				
527	Superior street and Central avenue (southeast and northwest corners).....				
566	Sixth and E streets NE. (southeast corner).....				
567	Sixth and F streets NE. (southwest corner).....				
636	Sixteenth street NW., just north of Florida avenue.....				
504	Thirty-seventh street and Prospect avenue NW.....				30
505	Twelfth and H streets NE. (northeast and northwest corners).....				63
510	Third and L streets NE. (northeast corner).....				18
516	Third and R streets NW. (northwest corner).....			3	
528	Square 1010.....				104
541	Twelfth and D streets NE. (northwest and southeast corners).....			9	
542	Thirteenth and D streets NE. (northwest and southeast corners).....			48	
543	Tenth and D streets NE. (southwest and northeast corners).....			45	
546	Square 1209.....			6	
553	Square 1005.....		8		
569	Twenty-second street and New York avenue NW. (northeast corner).....				9
570	Twenty-second and D streets NW. (northeast corner).....				9
571	Twenty-second and D streets NW. (northwest corner).....			30	
572	Twenty-second and E streets NW. (northwest corner).....				3
573	Twenty-second street and New York avenue (northwest corner).....				30
577	Twentieth and D streets NW. (northeast corner).....				
578	Twentieth street and New York avenue NW. (northeast and northwest corners).....				
580	Twenty-first street and New York avenue NW. (northwest, northeast, southwest, and southeast corners).....				81
581	Twenty-third street and New York avenue NW. (northeast corner).....				
589	Twenty-second and P streets NW. (northeast and southeast corners).....				
592	Twenty-sixth street, between Water and D streets.....				
595	Square 378.....				
598	Twenty-ninth street NW., between O and P streets.....				12
606	North roadway Pennsylvania avenue and Twelfth street SE. (southwest corner).....			12	
607	North roadway Pennsylvania avenue and Twelfth street SE. (southeast corner).....			66	
608	North roadway Pennsylvania avenue and Thirteenth street SE. (southwest corner).....			63	
634	Twentieth and Baltimore streets NW. (intersection).....			111	
664	U street NW., at Flagler place.....				15
550	Vermont avenue and O street NW.....			48	
568	North curb Virginia avenue and south curb G street NW. (intersection).....				6
579	Virginia and New York avenues NW. (northeast and northwest corners).....				78
586	Virginia avenue crossing, near intersection Twenty-third street.....				61
582	W street NW., between Florida avenue and Fifteenth street.....				12
656	Whitney avenue, between Thirteenth and Fourteenth streets.....			48	
	Total.....	84	175	1,565	3,044

<sup>1</sup> Awaiting bill for repairs to pavements.

OPERATIONS OF THE ENGINEER DEPARTMENT, D. C. 133

(Continued.)

wars laid (length in feet).			Gutter inlet.	Manholes.	Basins.	Branches.	Cost of materials.	Cost of labor.	Cost of repairs to pavements.	Total cost.
18-inch.	24-inch.	34-inch.								
					1		\$29.57	\$25.95		\$55.52
					2		65.08	86.05	\$29.70	180.83
					1		21.36	24.04		45.40
					1		27.14	24.07		51.21
					1		31.36	33.64		65.00
					1		61.79	56.72		118.51
					1		41.83	52.74		94.57
					1		31.91	41.35		73.26
					1		31.23	26.97		58.20
					1		27.80	25.11		52.91
					1		35.48	35.30		70.78
					1		42.90	34.18		77.08
				1	1		54.33	45.73		100.06
				1	2		88.99	70.32		159.31
					1		26.42	24.00	2.10	52.52
					1		29.33	29.43		58.76
			39				51.46	74.76		126.22
					1		36.97	46.20		83.17
					2		69.77	89.70	15.72	175.19
					1		31.78	31.17		62.95
					1		25.74	22.73		48.47
36				2		1	96.93	172.10	1.64	270.67
					2		51.23	39.56		90.79
					2		60.46	53.85		114.31
					2		59.87	64.96		124.83
					1		18.31	17.40		35.71
						1	2.12	6.24	3.91	12.27
					1		28.26	27.69		55.95
					1		28.55	29.43		57.98
					1		32.89	38.35		71.24
					1		26.43	30.19		56.62
					1		34.79	34.62		69.41
					1		45.86	39.35		85.21
					2		70.43	51.57		122.00
					4		122.72	98.72		221.44
					1		34.23	28.52		62.75
					2		50.58	56.45	33.08	140.11
	9						6.93	124.61		
				1		4	74.26	104.09	93.75	272.10
340				3		8	280.00	506.21	84.02	870.23
				1	1		52.59	52.95		105.54
					1		42.06	51.48		93.54
					1		41.62	50.81		92.43
72				1	4		196.64	241.75		438.39
					1		32.27	28.78	10.69	71.74
					1		37.64	59.74	19.32	116.70
					1		27.42	24.34		51.76
					2		72.89	65.05		137.94
					1		48.55	162.10	30.40	241.05
					1		31.36	27.43		58.79
					1		32.31	32.07		64.38
2,010	1,368	546	39	55	157	97	10,998.95	15,983.09	1,110.54	28,092.71

\* Includes \$9.65, cost of work by plumber.

TABLE 7.

No. of order.	Location.	Pipe sewers (length in feet)	
		8-inch.	10-inch. <sup>1</sup>
804	Block 7, Bloomingdale		
825	Baltimore and Ohio R. R. (right of way), between Maple avenue and Blair road		367
808	Cincinnati street NE., between Third and Fourth streets		
815	Champlain avenue NW., between Superior and Erie streets		
824	Chestnut avenue crossing, Baltimore and Ohio R. R.	93	
826	California avenue NW., between Eighteenth street and Florida avenue		
805	Dartmouth street NW., between Eleventh street and Sherman avenue		
802	Folsom street, from Newark street northward	206	
807	Fifth street NW., between Des Moines and Erie streets		
809	Fifth street NW., between Erie and Flint streets		396
817	Fillmore street, between Harrison and Jackson streets		
806	Jefferson street, between Polk and Fillmore streets		
827	Le Droit avenue, between Seaton and Thomas streets		54
829	Maple avenue, between Baltimore and Ohio R. R. and Carroll avenue		206
828	North Capitol street, between Seaton and T streets		
812	Ontario avenue, between Superior and Erie streets		
813	do		
811	Phelps place NW., between S street and Florida avenue		
821	Piney Branch road, from Vermillion street northward		
816	Randolph street, crossing North Capitol street		
819	Randolph street, crossing First street NW		
818	S street NW., between Phelps place and Florida avenue		
800	Thirty-seventh street, between W and Y streets	27	
801	Thirty-fourth street, from Newark street northward	199	
806	Third street NW., between Genesee and Kanawha streets		
814	Block 23, Rosedale and Isherwood subdivision		
820	Third and Quincy streets NE. (intersection)		
810	W street NE., between Fourth and Fifth streets		
822	Wallace street, between Frankfort and Hartford streets		169
823	Woodley road, between Thirty-sixth street and Wisconsin avenue		463
Total		526	1,655

<sup>1</sup> Awaiting bill for repairs to pavements.

\* Includes \$8 cost of work by plumber.

OPERATIONS OF THE ENGINEER DEPARTMENT, D. C. 135

2 sewers.

Sewers laid (length in feet).			Man-holes.	Branches.	Cost of materials.	Cost of labor.	Cost of repairs to pavements.	Total cost.
h.	18-inch.	21-inch.	24-inch.					
1	126			1	3	\$102.56	\$243.73	\$346.29
				3	2	191.35	255.71	447.06
	406			2	3	280.13	574.25	854.38
	371			1	1	241.25	385.85	577.10
				1		48.02	72.98	121.01
6				1	2	85.47	172.05	(1)
	63			1		61.19	96.30	157.49
				1	4	61.29	131.53	192.82
				2	1	176.17	482.41	658.58
				2	9	153.72	310.35	464.07
				2	5	88.95	139.95	228.90
				1	8	96.60	139.35	235.95
7	63			1		94.71	158.46	253.17
					4	66.72	151.76	218.48
0				1		94.65	119.55	(1)
		376		2	5	358.98	483.70	842.68
	253			1	11	182.29	342.79	525.08
	96			1		78.21	137.03	215.24
				1		94.57	169.90	264.47
6				1		51.10	79.25	130.35
		21		1		30.69	43.28	73.97
	318			2		226.18	375.04	601.22
						3.83	16.85	20.68
				1	2	60.14	163.18	223.32
						48.22	505.59	553.81
				1	1	32.44	39.84	72.28
3	42			2		82.64	97.58	(1)
	63	243	18	3		316.37	415.19	731.56
				2		46.16	141.35	187.51
				1	5	156.35	643.12	799.47
2	1,800	640	18	30	66	3,610.96	7,037.87	10,648.83

Work completed in fiscal year 1902.

One fish pond, 396 linear feet 4-inch inlet and 284 linear feet 4-inch outlet, constructed.

TABLE 8.—*Miscellaneous appropriations in*

No. of order.	Location.	Pipe sewers laid (length in feet).					
		6-inch.	8-inch.	10-inch.	12-inch.	15-inch.	18-inch.
1036	A street NE., between Fourth and Seventh streets.				12		
1049	I street SW., just west of First street.				6		
1052	B street NE., between Third and Seventh streets.				9		
1050	C street NW., between First and New Jersey avenue.				147		
1000	F street NE., between Delaware avenue and Third street.						
1008	Fifth and G streets NW. (northwest and southwest corners)				30		
1028	Fifteenth and B streets NW. (northeast and northwest corners)				12		
1032	Fourteenth and T streets NW. (northwest and southwest corners)				6		
1031	Fourteenth and V streets NW. (northwest corner).				3		
1040	F street NE., between North Capitol and Delaware avenue.						
1022	Sixth street and Massachusetts avenue NW. (northwest corner)					6	
1027	Sixteenth and B streets NW. (northeast and northwest corners)				6		
1034	Twenty-third and L streets NW. (northeast and northwest corners)				48		
1035	Twenty-third and M streets NW. (northwest and southwest corners)				63		
1048	Twelfth and Maryland avenue and Twelfth and D streets NE.				6		
1047	Bennings road, just east of Eastern Branch						
1053	Bladensburg road, between H and Levis streets						
1011	Eighteenth street and Virginia avenue (northwest corner).				12		
1012	Nineteenth street and Virginia avenue NW. (northwest corner)						3
1013	New York avenue and Nineteenth street NW. (northwest corner)				33		
1041	Q street, just west of First street NW.						
1014	Twentieth street and Virginia avenue NW. (northwest corner)				3		
1015	Twentieth and E streets NW. (northwest corner)				3		
1016	Twenty-first street and Virginia avenue NW. (northwest corner)					15	
1017	Twenty-first and E streets NW. (northwest corner)				6		
1010	Fortieth and Xenia streets NW.	<sup>2</sup> 146					
1023	Fifteenth street NE., between Gales and Rosedale streets.	<sup>2</sup> 594					
1020	Fourth and F streets NE. (southwest corner).					12	
1030	Fourth and E streets NE. (southeast and southwest corners)				21		
1051	Fifth and F streets NE. (southeast and southwest corners).				3		
1002	Ninth and D streets NE. (southeast corner).						
1001	Tenth and D streets NE. (southeast corner).			3			
1003	Twelfth and D streets NE. (southwest corner).						
1004	Thirteenth and D streets NE. (southwest corner).				9		
1033	Fortieth street NW., between Loughboro road and Xenia street.	360					
1042	Fortieth and Xenia streets NW.	<sup>4</sup> 100					
1005	G street NW., between Sixth and Fifteenth streets.	6			45	6	
1009	Sixth and G streets NW. (northeast and southeast corners).				12		
1019	Half and G streets SW. (southwest corner).				3		
1018	First and I streets SW. (northeast corner).				3		
1025	Squares 617 and 609						
1044	Ninth and E streets SE. (southeast corner).	15			18		
1045	Ninth and E streets SE. (northeast corner).						
1046	Pennsylvania avenue SE., between E and Eleventh streets.						
1000	Second and L streets SE. (northwest corner).						
1007	South Capitol and K streets SE. (southeast corner).						
1038	Pennsylvania avenue NW., between First and Seventeenth streets.						
1039	Pennsylvania avenue NW.						

<sup>1</sup> Work completed in fiscal year 1902.<sup>2</sup> Constructing drain around chemical engine house, 9 linear feet 4-inch pipe used in addition to pipe in table.<sup>3</sup> Constructing drain around school building.<sup>4</sup> Constructing drain around chemical engine house.

# OPERATIONS OF THE ENGINEER DEPARTMENT, D. C. 137

ar 1901; work performed by day labor.

pipe.	Branches	Manholes ad-justed.	Man holes constructed.	Basins ad-justed.	Basins con-structed.	Cost of materials.	Cost of labor and con-tingen-cies.	Total cost.	Appropriations.
					4	\$103.85	\$130.24	\$224.09	Repairs to streets, 1901.
					1	18.20	24.81	43.01	Do.
					2	78.90	82.30	161.20	Do.
			1			120.24	202.75	321.99	Do.
						94.08	109.61	203.69	Do.
						45.62	71.99	117.61	Do.
					2	54.05	52.16	106.21	Do.
					1	52.66	66.63	119.29	Do.
					1	27.16	28.04	55.20	Do.
					1	50.94	53.35	104.29	Do.
					1	27.59	26.79	54.38	Do.
					2	52.51	56.01	108.52	Do.
					2	65.97	56.90	122.87	Do.
					2	69.71	78.04	147.75	Do.
		3			1	26.66	31.33	57.99	Do.
						20.47	42.83	63.30	Improvements, Bennings road, east of Eastern Branch.
							8.14	(1)	Bladensburg road, 1901.
					1	29.69	32.87	62.56	Improvements and repairs, northwest section.
			1		1	69.50	76.27	145.77	Do.
					1	36.76	36.48	73.24	Do.
					1	8.26	5.83	14.09	Do.
					1	26.43	27.92	54.35	Do.
					1	26.43	22.45	48.88	Do.
					1	32.27	35.28	67.55	Do.
					1	43.35	33.81	77.16	Do.
			1		1	27.42	74.67	102.09	Buildings, fire department, Tennallytown.
	3					117.42	222.32	339.74	Eight room school building site, northeast, 1901.
					1	30.29	34.15	64.44	Improvements and repairs, northeast section, 1901.
					2	57.03	55.45	112.48	Do.
					1	52.49	50.15	102.64	Do.
					1	25.84	27.34	53.18	Do.
					1	26.29	26.05	52.34	Do.
					1	17.00	24.36	41.36	Do.
					1	24.23	27.37	51.60	Do.
						24.73	101.20	125.93	Chemical Engine Co., Tennallytown, 1901.
	2					11.45	67.75	79.20	Do.
					6	153.77	* 183.51	337.28	Improvements and repairs, widening G street.
					2	51.92	67.69	119.61	Do.
					1	16.66	28.09	44.75	Improvements and repairs, southwest section, 1901.
					1	17.20	22.63	39.83	Do.
							* 30.22	30.22	Site 8-room school, tenth division, colored.
					1	31.92	42.03	73.95	Improvements and repairs, southeast section, 1901.
					1	25.11	27.99	53.10	Do.
					1	6.93	8.69	15.62	Do.
					1		6.13	6.13	Do.
					1	17.24	24.21	41.45	Do.
						45.44	* 328.61	* 374.05	Emergency fund, 1901.
						1,364.10	830.33	* 2,194.43	Maintain public order February and March, 1901.

\* Includes \$3.30, cost of work by plumber.

\* Digging test holes.

\* Includes \$37.75, cost of repairs to pavements.

\* Roping off Pennsylvania avenue for centennial parade.

\* Roping off Pennsylvania avenue for inaugural parade.

TABLE 8.—*Miscellaneous appropriations in*

No. of order.	Location.	Pipe sewers laid (length in feet).					
		6-inch.	8-inch.	10-inch.	12-inch.	15-inch.	18-inch.
1021	Second street and South Carolina avenue SE.....	302					
1037	Seventh and Vermillion streets.....	464					
1043	.....do.....	75					
1024	Sixteenth and Crescent streets (southwest corner).....				12		
1020	Twenty-ninth and Q streets NW.....			30			
1	Siphons—various.....	123	9				
2	Siphons—Morris and Fifteenth streets NW, (intersection).....	3					
1	Arizona avenue—Arizona avenue crossing Joliet street.....	150					
1026	Grant and School streets NW.....						
	Total.....	2,398	9	33	531	45	39

<sup>1</sup> Constructing drain around school building.

<sup>2</sup> Includes \$18.51, cost of work by plumber.

<sup>3</sup> Includes \$6.36, cost of work by plumber.

OPERATIONS OF THE ENGINEER DEPARTMENT, D. C. 139

for year 1901; work performed by day labor—Continued.

diameter.	4-inch lead pipe.	Branches.	Manholes adjusted.	Manholes constructed.	Basins adjusted.	Basins constructed.	Cost of materials.	Cost of labor and contingencies.	Total cost.	Appropriations.
							\$74.53	\$115.99	<sup>1</sup> \$190.52	Eight-room school, third division, southeast.
		1					73.57	199.65	<sup>1</sup> 273.22	School building site, Takoma Park.
				1			29.90	51.31	81.21	Do.
					1		21.54	27.13	48.67	Grading and improving Crescent street.
						2	58.87	70.51	129.38	Improvements and repairs, Georgetown, 1901.
	75			5		5	347.27	<sup>2</sup> 382.53	729.80	Automatic flushing tanks.
	6			1		1	50.50	<sup>2</sup> 58.39	108.89	Do.
1.6				1			773.89	1,140.39	1,914.28	Arizona avenue sewer, 1901.
						43	52.25	<sup>2</sup> 100.15	152.40	Repairs and improvements, school buildings and grounds.
1.6	81	6	3	12	5	72	4,817.10	5,839.82	10,648.78	

<sup>1</sup> Constructing basins and 103 linear feet 4-inch drain in yard of Johnson School.

<sup>2</sup> Includes \$10.96, cost of work by plumber.

140 OPERATIONS OF THE ENGINEER DEPARTMENT, D. C.

TABLE 9.—Average cost of materials and labor per linear foot of pipe sewers constructed by day labor, also average cost of basins.

[In this table it is assumed that the cost of materials used in basin connections is the same as that in the same size sewer; it is also assumed that on account of the difference in depth of excavation the cost of labor is half the cost of that of the same size sewer. This table does not embrace the cost of work of exceptionally difficult construction.]

Size of sewers.	Length.	Cost of materials.	Cost of labor.	Total cost.
	<i>Feet.</i>	<i>Per foot.</i>	<i>Per foot.</i>	<i>Per foot.</i>
8-inch	4,888	\$0.30	\$0.785	\$1.085
10-inch	11,534	.408	.859+	1.267
12-inch	17,936	.46	.919	1.379
15-inch	2,586	.638+	1.19+	1.828
18-inch	4,111	.728+	1.382+	2.11
21-inch	2,188	.888+	1.499+	2.387
24-inch	633	1.175	2.196	3.371
8-inch connection	39	.30	.302	.602
10-inch connection	1,470	.408	.429	.837
12-inch connection	1,818	.46	.459	.919
15-inch connection	1,014	.638	.595	1.233
18-inch connection	129	.728	.691	1.419
21-inch connection	117	1.175	1.098	2.273
24-inch connection	223	22.798	24.097	46.895
Basins constructed				

TABLE 10.—Number of foremen, inspectors, and other employees of the sewer division, offices of the chief clerk, disbursing officer, inspector of asphalt and cements, and of the engineer stables, temporarily employed, and appropriation from which paid, for year ending June 30, 1901.

Class.	Number employed.	Cleaning and repairing sewers and basins.	Replacing obstructed sewers.	Main and pipe sewers.	Suburban sewers.	Assessment permit and whole cost.	Preparation, plans and specifications, sewage disposal system.
Foremen	11	\$6,174.57	\$567.00	\$1,246.00	\$457.50	\$1,992.50	\$303.50
Inspectors	16	104.00	44.00	1,036.00	1,256.00	197.00	
Other employees.	343	27,223.06	8,419.74	19,731.32	8,212.31	26,458.56	8,998.97
Total		33,501.63	9,030.74	22,013.32	9,925.81	28,648.06	9,302.47

Class.	Arizona avenue sewer.	Automatic flushing tanks.	East side intercepting Twelfth street SE. and pumping station.	East side intercepting Twenty-second and A streets NE. and Twelfth street SE.	Tiber Creek and New Jersey avenue high-level intercepting sewer.	L street sewer.	Sewage pumping plant.	Extension boundary sewer.	Repairs to streets.
Foremen	\$100.00	\$41.00							\$91.00
Inspectors	804.00		\$1,448.50	\$1,511.50	\$2,034.00	\$720.00	\$423.50	\$312.00	
Other employees.	1,220.84	375.25	903.25	941.17	564.70	705.88	941.17		778.33
Total	2,123.84	416.25	2,351.75	2,452.67	2,598.70	1,425.88	1,364.67	312.00	869.33

Class.	Improving Benning road, east of Eastern Branch.	Bladensburg road.	Improvements and repairs, NW section.	Buildings for fire department, Tennallytown.	Eight-room school building site, NE section.	Improvements and repairs NE section.	Chemical engine company, Tennallytown.	Improvements and repairs widening G section.	Improvements and repairs SW section.
Foremen	\$4.00	\$1.00	\$19.00	\$8.00	\$15.00	\$26.00	\$5.00	\$17.00	\$5.00
Other employees.	35.82	61.65	214.30	61.81	191.14	238.47	65.27	219.14	42.69
Total	39.82	62.65	233.30	69.81	206.14	264.47	70.27	236.14	47.69

TABLE 10.—Number of foremen, inspectors, and other employees, etc.—Continued.

Class.	Site 8-room school building, Tenth division, colored.	Im-provements and repairs, S.E. section.	Emer-gency fund.	Mainte-nance public order, February and March.	Eight-room school building, Third division, colored.	School building and site, Takoma Park.	Grading and im-provement, Crescent street.	Im-provements and repairs, Georgetown.	Repairs and im-provements, school buildings and grounds.
Foremen.....	\$5.00	\$8.00	\$45.00	\$89.50	\$9.00	\$21.00	\$2.00	\$5.00	\$10.00
Other employees.	23.78	45.48	245.85	467.09	97.92	216.95	22.81	59.35	68.54
Total.....	28.78	53.48	290.85	556.59	106.92	237.95	24.81	64.35	78.54

TABLE 11.—Amount of conduits laid from March 27, 1900, to June 30, 1901.

No. of duct.	United States Electric Light-ing Co.		Chesapeake and Potomac Tele-phone Co. <sup>1</sup>		Potomac Electric Power Co.	
	Conduit.	Duct.	Conduit.	Duct.	Conduit.	Duct.
	Feet.	Feet.	Feet.	Feet.	Feet.	Feet.
1.....						
2.....			677	1,354		
4.....	13,836	55,344	124	496	2,450	9,800
8.....	30	240			71	568
20.....			20	640		
40.....			55	2,200		
Total .....	13,866	55,584	876	4,690	2,521	10,368

No. of duct.	Brightwood Rail-way Co.		District of Co-lumbia.		Private conduits.	
	Conduit.	Duct.	Conduit.	Duct.	Conduit.	Duct.
	Feet.	Feet.	Feet.	Feet.	Feet.	Feet.
1.....			2,913	2,913	30	30
2.....					227	454
4.....						
8.....	88	704				
20.....						
40.....						
Total .....	88	704	2,913	2,913	257	484

<sup>1</sup> For house connections only.

NUMBER OF MANHOLES AND HAND-HOLES BUILT.

	Manholes.	Hand-holes.
United States Electric Lighting Co .....	79	271
Potomac Electric Power Co .....	16	43
Chesapeake and Potomac Telephone Co .....	8	
District of Columbia .....		
Washington, Alexandria and Mount Vernon Railway Co.....	1	
Brightwood Railway Co .....	1	1
Metropolitan Railroad Co .....	2	
City and Suburban Railway Co .....	2	
Total .....	108	315

TABLE 11.—Amount of conduits laid, etc.—Continued.

SUMMARY OF CONDUITS IN USE JUNE 30, 1901.

No. of duct.	United States Electric Light- ing Co.		Chesapeake and Potomac Tele- phone Co.		Potomac Electric Power Co.	
	Conduit.	Duct.	Conduit.	Duct.	Conduit.	Duct.
	<i>Feet.</i>	<i>Feet.</i>	<i>Feet.</i>	<i>Feet.</i>	<i>Feet.</i>	<i>Feet.</i>
1	26,177	26,177	15,506	15,506	1,557	1,557
2	129,126	256,232	4,364	8,708	766	1,532
3	236	708				
4	73,209	232,826	660	2,640	6,019	24,073
5	35,461	212,766	23,185	139,110	9,488	54,223
6			82	574		
7			18,060	144,720	8,634	69,072
8	11,352	90,816	114	1,026	7,288	65,282
9						
10	88	880				
12	1,491	17,892	4,963	59,556	37,979	458,768
13			212	2,756	374	4,982
14	1,224	18,126				
15	68	1,020				
16	2,793	44,688	5,825	93,200	1,314	21,084
17			636	10,812		
18			1,576	28,368		
20			28	520	85	1,700
22						
24	2,069	50,376	2,072	49,728		
25			304	7,600		
26						
28						
30	53	1,580				
32			465	15,520		
36	3,854	128,744	28	936		
40			1,569	63,560		
44					424	18,656
56			749	41,944		
58					7	408
64	106	6,784	176	11,264		
72			76	5,472		
Total	286,337	1,159,665	80,796	708,610	73,935	721,233

No. of duct.	Brightwood Rail- way Co.		District of Co- lumbia.		Private conduits.	
	Conduit.	Duct.	Conduit.	Duct.	Conduit.	Duct.
	<i>Feet.</i>	<i>Feet.</i>	<i>Feet.</i>	<i>Feet.</i>	<i>Feet.</i>	<i>Feet.</i>
1			464		30	30
2	13	26	80		227	454
3						
4			44			
6			711			
7						
8	176	1,408				
9						
10						
12						
13						
14						
15						
16						
17						
18						
20						
22						
24						
25						
26						
28						
30						
32						
36						
40						
44						
56						
58						
64						
72						
Total	189	1,434	1,289		257	484

**TABLE 11.—Amount of conduits laid, etc.—Continued.**

[illegible]

No. of duct.	Metropolitan R. R. Co.		City and Suburban R. R. Co.		Total.	
	Conduit.	Duct.	Conduit.	Duct.	Conduit.	Duct.
	<i>Feet.</i>	<i>Feet.</i>	<i>Feet.</i>	<i>Feet.</i>	<i>Feet.</i>	<i>Feet.</i>
					59,973	59,973
					140,308	298,616
					236	708
	21,661	86,644	11,040	44,160	123,151	492,604
			5,117	30,702	81,282	487,692
					111	777
			13,248	105,984	54,420	435,360
					7,402	66,618
			8,030	80,300	8,363	83,630
	11,381	136,572	77	924	55,891	670,692
					586	7,718
			1,880	26,320	7,361	104,054
					68	1,020
					9,932	158,912
					636	10,812
			2,214	39,852	3,790	68,220
					111	2,220
			134	2,948	9,243	203,346
					4,171	100,104
					304	7,600
					280	7,280
			87	2,436	87	2,436
					53	1,590
					485	15,520
					3,880	130,680
			193	7,354	193	7,334
					1,589	63,560
					424	18,656
					749	41,944
					7	406
					282	18,048
					76	5,472
<b>total</b>	<b>33,042</b>	<b>223,216</b>	<b>42,020</b>	<b>340,960</b>	<b>584,444</b>	<b>3,582,602</b>

## REPORT OF THE INSPECTOR OF PLUMBING.

WASHINGTON, D. C., *September 11, 1901.*

CAPTAIN: I have the honor to submit the nineteenth annual report of the division of plumbing inspection for the fiscal year ended June 30, 1901.

## INSPECTION AND RECORDS.

The total number of inspections made during the year was 21,692, or, excluding 2,727 inspections of hydrants, 18,965, an increase of 1,560 over those of the previous year. These comprise 4,090 examinations of existing plumbing; 8,129 inspections of remodeling, extensions, and repairs; 3,318 inspections of plumbing in new buildings; 510 peppermint tests; 997 inspections of gas piping or gas fixtures; 707 inspections of lead water-service pipes; 601 sewer laterals tapped into main sewers; 179 new terra-cotta house sewers, and 420 repairs to terra-cotta sewers. The number of notices personally served upon property owners preparatory to prosecution was 14.

The office work performed shows a decrease, mainly due to the less number of hydrant notices issued and decrease in correspondence respecting hydrants. The number of letters written, orders and indorsements made, amounts to 2,823, the detail of which includes miscellaneous letters, 376; letters to master plumbers, 190; orders to repair plumbing or gas fitting, 525; hydrant repair or replacement notices, 787; indorsements on communications forwarded, 798; letters to the Engineer Commissioner and other District officials, 127, and specifications for plumbing work in District buildings, 20. Plumbing plans were examined and approved and certificates issued for 971 new buildings, which is a greater number than were under consideration in previous years.

## YARD HYDRANT INSPECTIONS.

The work of inspection of yard hydrants and the service and execution of notices upon defective fixtures of this type was continued with a diminished force of inspectors until the end of the fiscal year. The number of inspections of hydrants was 2,727; of repair notices issued, 682; of replacement orders, 105. The number of new hydrants installed was 584, and the cases in which the hydrant fixture was altogether removed, 42.

## PLUMBING REGULATIONS.

The revised plumbing regulations constituting the fourth edition took effect January 1, 1901, and the volume of inspections was materially increased by the new provisions. On account of the promulgation of the changes a number of months before the date of taking effect, the plumbers obtained advance information respecting the application of the various rules, so that little friction has been experienced in working under them, and but few changes have been required in work in progress.

The increase of peppermint tests from 194 in the previous year to the 510 recorded above indicates the increased work in six months, due to the requirement of final inspection upon each new house. It is believed to be necessary to substitute for the peppermint tests now in vogue a system of smoke tests as a final method of proving plumbing work.

## PLUMBING IN PUBLIC SCHOOLS.

Plans and specifications were prepared for the renovation of the plumbing in the Force, Grant, Gales, and Garnet school buildings.

The work in the Force school consisted in removing a defective vitrified pipe sewer from the basement and substituting a cast-iron line. There was also constructed a detached two-story-and-cellar toilet building, fully equipped with fixtures of advanced types, and provided with independent steam-heating apparatus. In the other three buildings general toilet facilities were introduced in the basement, and small fixtures provided on the upper floors. Porcelain drinking fountains, having the slab and back in one piece, and three faucet and waste outlets, were constructed for the first time and introduced into these buildings. There were also used double-stall ventilated urinals located in the center of the toilet rooms instead of along the side, which fixtures mark a considerable advance over those heretofore designed.

Arrangements have been made for the prosecution during the summer vacation of work upon the toilet rooms for the Lincoln, Mott, and Randall buildings, and the erection of a single structure containing a boiler room and toilet facilities for the Addison and Curtis schools.

## PROSECUTIONS.

Nineteen cases involving violation of the plumbing and gas-fitting laws were brought to the attention of the police court, 16 of which were for the violation of the plumbing laws, two for gas fitting by unregistered persons, and one for excavation in a public street without a permit. In 16 of these cases fines were imposed. One case was dismissed for lack of sufficient evidence to convict, one was nolle prossed by order of the Commissioners, and one plumber was released on personal bonds. The fines imposed were somewhat greater than in previous years, a fine of \$25 having been imposed in one case and \$20 in another, but in eight cases fines of \$5 each were imposed, and in one case of a second offense only \$10. It is therefore still my opinion that the penalties imposed are not sufficiently heavy to prevent repetitions of these offenses.

## PUBLIC-COMFORT STATIONS.

The need for the construction of a suitable number of public-comfort stations still exists and is more fully recognized by the District officials and the public generally than heretofore. The experience of the subcommittee in charge of these matters during the late inauguration ceremonies emphasizes the great necessity which occurs for such conveniences during occasions that bring together large numbers of people. The five stations erected by them were used by hundreds of persons.

Although I believe that a considerable number of such buildings should be at once provided, the question of sites is such a difficult one that I recommend that a beginning be made by the construction of a suitable building at the intersection of Seventh and C streets NW. with Louisiana avenue, in the space now under the control of the Commissioners. If it be deemed inadvisable to request an appropriation of \$18,000 for this purpose, an appropriation of at least \$1,000 should be asked to prepare plans, in order that the matter may be brought into a more advanced state of preparation.

## PERSONNEL.

I have to note with regret the resignation, on account of serious ill health, on October 21, 1900, of Nicholas J. Plass, one of the oldest inspectors in the service, whose fidelity to the trust reposed in him was unceasing. On October 29 Michael J. McCarthy was appointed to the vacancy. The resignation of Martin T. Conboy, on October 14, 1900, to accept a situation offering greater advancement, and the appointment of Jacob P. Stirewalt, on October 30, 1900, to the vacancy, marks another change in the force of the office.

The assistants have performed their increased duties throughout the year with uniform faithfulness, and are entitled to credit for the satisfactory character and increased number of inspections made. It is very difficult in performing inspections, in the short amount of time now available, to be certain that the work attains the high standard of workmanship and skill heretofore set.

I have to recommend, in connection with the estimates for the next year, the increase of the field force by two assistants. One is needed on account of the increased volume of work due to the great number of buildings under erection and the added attention devoted to the design of plumbing in District structures, and a second is required to conduct the work of final inspections and tests.

Very respectfully,

CHAS. B. BALL,  
*Inspector of Plumbing.*

Capt. LANSING H. BEACH,  
*Corps of Engineers, U. S. A.,*  
*Engineer Commissioner District of Columbia.*  
(Through Captain Harding.)

## REPORT OF THE PLUMBING BOARD.

WASHINGTON, D. C., September 9, 1901.

CAPTAIN: I have the honor to submit the following statement of the work of the plumbing board during the third year of its organization:

There were held during the year 25 sessions, most of which were devoted to the examination of candidates for master plumbers' licenses. There was no change in the personnel of the board or in its officers.

The total number of examinations conducted was 18. The number of original candidates examined was 8, of whom 3 passed. The number of those who had previously been examined was 10, of whom 3 passed.

The examinations throughout the year, with a single exception, were by the use of written questions and answers, and there is no division in the opinion of the board that such a method is far preferable to the oral one. No practical examination has yet been introduced, but it is hoped that provision may be made for the examination of candidates in this regard.

We request that an appropriation of \$226 be asked to provide tools and materials and fit up a room for the purpose of testing applicants for licensing as master plumbers as to their skill in the work of the trade.

Very respectfully,

JOS. R. QUINTER, *President.*  
CHAS. B. BALL, *Secretary.*

Capt. LANSING H. BEACH,  
*Corps of Engineers, U. S. A.,*  
*Engineer Commissioner District of Columbia.*  
(Through Captain Harding.)

### REPORT OF THE INSPECTOR OF BUILDINGS.

WASHINGTON, August 27, 1901.

CAPTAIN: I have the honor to submit herewith the annual report covering the transactions of the building department for the fiscal year ending June 30, 1901, together with recommendations for the fiscal year ending June 30, 1903:

*Statement of permits issued from June 30, 1900, to July 1, 1901.*

Description.	Number.	Value.	Description.	Number.	Value.
Brick dwellings .....	571	\$2,088,686	Workshop (frame).....	1	1,650
Frame dwellings .....	163	295,197	Greenhouse .....	5	3,265
Brick repairs .....	808	801,968	Engine and boilers .....	46	107,790
Frame repairs .....	532	66,272	Boiler house .....	3	26,100
Apartment houses (brick)	126	2,183,150	Vault or underground		
Apartment houses			construction .....	4	610
(frame) .....	2	11,000	Assembly hall (brick) ..	1	18,000
Stores (brick) .....	12	29,700	Assembly hall (frame) ..	1	150
Stores (frame) .....	3	3,175	Base ball park, stands,		
Stores and dwellings			fences, etc. ....	1	10,000
(brick) .....	14	68,940	Athletic Park, stands,		
Stores and dwellings			fences, etc. ....	1	15,000
(frame) .....	3	3,200	Grand stand .....	1	500
Hotel .....	1	15,000	Inaugural stands .....	47	34,400
Office buildings .....	6	33,150	Waiting room (frame) ..	2	530
School .....	1	3,000	Wood and coal yard .....	2	400
Church (brick) .....	2	14,000	Sheds (brick) .....	12	3,310
Church (frame) .....	2	5,500	Sheds (frame) .....	551	18,320
Warehouse (brick) .....	6	23,500	Minor repairs .....	2,037	18,333
Warehouse (frame) .....	2	500	Awnings .....	115	8,625
Factory (brick) .....	7	65,000	Fire escapes .....	17	5,871
Factory (frame) .....	1	2,500	Elevators .....	30	133,330
Stable (brick) .....	33	37,839			
Stable (frame) .....	20	14,983	Total .....	5,190	6,194,080
Workshop (brick) .....	7	18,525			

# OPERATIONS OF THE ENGINEER DEPARTMENT, D. C. 147

*Comparative statement for years 1900-1901.*

	New build- ings.	Repairs.	Dwell- ings.	Apart- ments.
.....	1,057	1,806	734	128
.....	892	1,520	650	58
increase .....	165	376	84	70

ions of building operations:

.....	\$6,795,354
.....	6,194,080
decrease .....	601,274

er of permits issued, including buildings, repairs, and minor repairs, awnings,  
ts, etc:

.....	4,318
.....	4,595
increase .....	277

tions made and applications disapproved .....	55
tions made, applications approved, and permits uncalled for .....	61

following summary will show the distribution of improvements in the dif-  
sections of the District and the value of the same:

	Buildings.	Repairs.
west.....	\$2,226,530	\$686,825
y.....	1,832,928	89,436
east.....	689,755	42,143
east.....	258,142	39,551
west.....	98,676	26,512
Total .....	5,106,031	884,467

following are the receipts of the office for the past year:

building permits .....	\$3,545
awnings .....	115
boilers, engines, ovens, and furnaces .....	46
stands, inaugural, etc. ....	47
Total .....	3,753
ived for year 1900 .....	3,367
Increase .....	386

addition to the permits above enumerated miscellaneous permits were issued  
which no fees are exacted, consisting of renewals of entrance steps, temporary  
tures for the use of builders in connection with new construction, and extra  
pancey of public space for the temporary storage of building materials.  
e volume of work this office has had to deal with has been attended to as  
tly as it has been possible to do so, and, as the number of hours in an official  
is not sufficient to meet the demands of the public for inspections, the corps  
sistant inspectors have willingly worked beyond the official time allotted so  
o comply with the request of the contractors and builders for inspection of  
ches and foundations, in order to reduce to a minimum delays in construction.  
ffering to the tabulated statement above of the building operations of the  
s, it will be observed that the number of apartment houses erected and now in  
se of construction is a feature which necessarily attracts attention in view of  
great amount of capital invested in such buildings. That the owners of such  
lings are satisfied with their investments is manifested by the great number  
being erected in every section of the city, and the success heretofore met with  
ily securing tenants to fill them will continue. My observation, however,  
he records of this office show that the erection of private dwellings has been  
ed in number, so that within the city limits there are still many vacant  
es unimproved, and this is manifest in the immediate vicinity of the apart-  
houses.

Generally the structural features of buildings are far superior to those that prevailed several years ago, due to the more exacting details of the regulation of the supervision of construction rendered by this department. In connection with the subject above noted I desire to call your attention to that fact that in the same period the erection of dwelling houses has amounted in value to \$2,088,686.

Adverse criticism has been indulged in to a large extent by the builders and others interested in building, due to the loss of time in having proposed projects beyond the building line approved within a reasonable time after application has been made therefor to this office. By act of Congress passed March 3, 1878, extension of any building or buildings, or any part or parts thereof in the District of Columbia (now applicable to every part of the District) beyond the building line, and upon the streets and avenues, shall be granted, except upon special application and with the concurrence of all Commissioners and the approval of the Secretary of War.

As the applications for projections as now made necessarily pass through the hands of the Commissioners, the average time consumed before approval is secured is ten days in order to prevent unnecessary delay in the construction of buildings. The approval of applications for projections, and solely as a privilege, the Commissioners have permitted excavations within building lines to proceed in advance of the question of projections. This privilege has unfortunately been abused in many instances and unauthorized excavations have been begun without the building lines. Complaint of the necessary delay in the granting of building permits involving projections beyond the building line should be made until builders no longer abuse the privilege granted them with the object of delaying their operations.

The confusion now prevailing in house numbers in many parts of the District, especially in the suburbs, due to the subdivision of land into narrower lots, 20 feet in width, the limit first established for basing numbers and the erection of houses thereon, is a subject which must be corrected as quickly as possible. In partly improved squares it is manifest that the introduction of narrow lots will affect existing numbers on buildings previously erected, and to eliminate this confusion now prevailing, it is recommended that a commission, composed of three persons, be appointed, to whom a salary of \$1,000 each, per annum, be paid, that the correction of the house numbers may be accomplished at the earliest practicable moment.

The present corps of assistants have been faithful and painstaking in the discharge of their duties assigned them, but, as the volume of work as here stated has been large, they have cheerfully worked overtime to meet the demands made upon them.

In addition to the work of field inspection of construction this office has performed the task of reviewing all plans and the correction of specifications wherever necessary, for the several municipal buildings erected during the year. This work of reviewing the designs of the architects employed has been a task in many cases and has consumed valuable time before the proposals for execution of the work could be invited.

The contractors to whom the several buildings have been awarded have rendered them to the District in a satisfactory manner, and a disposition on the part of the contractors to comply with the obligations of their contracts have always been manifest.

The buildings completed during the year and those still under construction are as follows:

#### BUILDINGS COMPLETED.

Truck house E; contractor, John Hughes, jr., of Baltimore, Md.; cost, \$1,000.  
Chemical engine house, Tenley; contractor, John Hughes, jr., Baltimore; cost, \$16,195.

Truck house F, Whitney avenue; contractors, Pavarini & Greer; cost, \$12,845.  
Police station No. 10, Whitney avenue; contractors, Meads & Reynolds; cost, \$22,845.

Boys' Reform School, assembly hall, Bladensburg road; contractors, Pavarini & Greer; cost, \$11,460.

Dent School, South Carolina avenue and Second street SE.; contractor, Dunn; cost, \$33,980.

Webb School, Fifteenth and Rosedale streets NE.; contractor, J. M. Dunn; cost, \$33,885.

Birney School, Nichols avenue, Anacostia; contractors, Gleeson & Humphrey; cost, \$34,796.

Takoma Park School; contractor, Herman E. Burgess; cost, \$19,336.  
 Porch at Almshouse, Washington Asylum; contractor, D. F. Mockabee; cost, \$1,174.81.

## NOW BEING CONSTRUCTED.

Manual Training School No. 1, Seventh street and Rhode Island avenue NW.; contractor, W. E. Speir; cost, \$105,680.

Manual Training School No. 2, P street, between First and Third streets NW.; contractor, Arthur Cowill; cost, \$114,900.

Workhouse, rear wing, reservation No. 13, Washington Asylum; general contractor, W. E. Speir; cost, \$56,535.

Cell work, contractor, Pauly Jail Building and Manufacturing Company; cost, \$43,385.

Receiving ward, reservation 13, Washington Asylum; contractor, H. E. Burgess; cost, \$12,487.

Lovejoy School, Twelfth and D streets NE.; contractors, Pavarini & Greer; cost, \$34,400. Will be completed in September, 1901.

School building, Third and K streets SW.; contractor, J. M. Dunn; cost, \$35,719.

School building, One-half street, between N and O streets SW.; contractor, D. F. Mockabee; cost, \$38,743.

School building, Industrial Home School, Tenley road; contractors, Pavarini & Greer; cost, \$16,800.

School building, California avenue, Washington Heights; contractors, Pavarini & Greer; cost, \$35,200.

Engine house, Brookland; contractors, Burgess & Parsons; cost, \$6,317.

School building, Twining City; contractors, Gleeson & Humphrey; cost, \$32,340.

School building, Kenilworth; contractors, Pavarini & Greer; contract, \$22,515.

The superintendents of construction employed on the buildings above enumerated were as follows (compensation to July 1, 1901):

Edward Kern, truck house E; amount paid, \$444.

J. B. Bright, chemical engine house, Tenleytown; amount paid, \$692.

Philip Gormley, truck house F, Whitney avenue; amount paid, \$656.

Philip Gormley, police station No. 10; amount paid, \$320.

William J. Marsh, assembly hall, Boys' Reform School, appointed by the trustees, approved by Commissioners; amount paid, —.

Edward Kern, Dent School, Second street and South Carolina avenue SE.; amount paid, \$736.

E. G. Curtis, Webb School, Fifteenth and Rosedale streets NE.; amount paid, \$759.

L. E. Bond, Birney School, Anacostia; amount paid, \$769.50.

A. W. Brinck, Takoma Park School; amount paid, \$664.

John P. Healy, Manual Training School No. 1; amount paid, \$808. Appointed assistant inspector of buildings; P. F. Gormley now employed.

Harold Davis, Manual Training School No. 2; amount paid, \$956. Resigned; A. M. Poynton, now employed.

J. W. Bright, Lovejoy School, Twelfth and D streets NE.; amount paid, \$376. Now employed on workhouse.

L. E. Bond, Industrial Home School; amount paid, \$54. Transferred to Birney School, later to Manual Training School No. 2, and then to Lovejoy.

Frank McMaster, Industrial Home School, appointed in July, 1901.

George M. Thomas, school, Washington Heights; amount paid, \$32.

A. M. Proctor, engine house, Brookland; amount paid, \$28.

Since the 1st of July, 1901, contracts have been entered into for the construction of three school buildings, namely, one 4-room building in Petworth, one 8-room building on P street near North Capitol, and one 12-room building in Eckington.

The building regulations that were prepared by a commission of experts appointed by the Commissioners in 1896 have been found to be inadequate to meet the rapid improvement in building construction of the present day, and recognizing this fact, the Commissioners, in the early part of the year 1901, appointed a commission consisting of Capt. D. D. Gaillard, U. S. A., assistant to the Engineer Commissioner, and Assistant Inspector of Buildings Snowden Ashford to prepare such amendments as would meet the requirements of construction of the present day. This work has been completed and submitted to the Commissioners for their consideration.

Owing to the number of buildings recently erected approximating the limit of elevation allowed by the regulations, namely, 130 feet, and as there are others of this type now under consideration, and which no doubt will be erected in the near future, I wish to call your attention to the necessity of having a geological map

and sections of the District of Columbia, especially that portion with boundary lines of the city of Washington, prepared for use of this office, which reliable information can be given as to the character of the ground to be built upon. The data for this map, I believe, can be obtained from the office of the United States Geological Survey, and I respectfully request proper steps be taken to secure the preparation of this map.

As it is mandatory upon all applicants to make a subdivision of the land to be built upon, when other buildings exist upon the same lot of land, for the proper administration of the business of this department to reduce the loss of time of the applicants applying for such building permits, the honor to request that copies of all subdivisions of land be furnished to this office as soon as possible by the surveyor, District of Columbia, so that they may be properly filed in suitable form for ready reference.

Attention is invited to the appendix, which gives the report of the work performed by the assistant inspectors of buildings and elevators.

Very respectfully,

JNO. B. B.  
Inspector of Buildings

Capt. LANSING H. BEACH,  
Corps of Engineers, U. S. A.,  
Engineer Commissioner District of Columbia.  
(Through Captain Harding.)

WASHINGTON, D. C., August 1, 1901

SIR: We have the honor to submit statement of our official duties performed by the inspectors of buildings during the fiscal year ending June 30, 1901:

Visits to new buildings .....  
Visits to old buildings .....  
Visits of a miscellaneous character .....

Total, 1901 .....  
Total, 1900 .....

Increase .....  
Condemnations of dangerous buildings, or parts thereof:  
1900 .....  
1901 .....

Decrease .....  
Number of buildings renumbered .....

The increase in the actual number of visits is greater than in any previous year, in spite of the fact that members of your staff were again, as last year, kept down from overwork, much valuable time thus being lost.

The decrease in condemnations is not, as the above facts will prove, due to lack of attention to our official duties, but from the fact that more and more times have enabled the citizens to care for their properties by removal of dangerous buildings and also from the fact that one large building will now be erected in place of many small ones, as in previous years, thus decreasing the number of condemnations etc.

During the fiscal year just ended we have endeavored, with the limited staff of the office, to perform the duties intrusted to us. Our experience has been that from attending to the most trivial complaints to the supervision of the construction of cantile, office, and apartment buildings in course of erection and repair, that it is impossible to cover the vast territory allotted to each man with proper time and attention to the inspection of buildings for which he is responsible.

This having been the year of a Presidential inauguration, for two weeks prior to the 4th of March your entire staff of assistant inspectors were (in connection with their other duties) actively engaged day and night inspecting the construction of the many reviewing stands and superintending the work of reinforcing the sidewalks along and adjacent to the line of parade; not less than 2,000 premises were visited, and it is a matter of note that not one accident occurred through defective construction.

Your assistants find that a great amount of valuable time is consumed in issuing notices and making official reports in the office, and if they are pre-

a stenographer the office work will be reduced, thereby giving more time to the inspection of work in the field.

Thanking you for your consideration and support at all times, we have the honor to remain,

Very respectfully,

RICHD. M. EVANS,  
CHAS. A. HARKNESS,  
HENRY STOREY,  
THOS. FRANCIS,

*Assistant Inspectors of Buildings.*

Mr. JOHN B. BRADY,  
*Inspector of Buildings, District of Columbia.*

WASHINGTON, D. C., August 8, 1901.

DEAR SIR: I have the honor to report the work performed by the inspector of elevators and fire escapes for the fiscal year ending June 30, 1901:

New elevators installed.....	30
Condemnations of elevators during installation.....	12
Elevators examined.....	923
Elevators condemned, for repairs.....	261
Fire escapes erected.....	17
Fire-escape condemnations during erection.....	11
Fire escapes ordered (compulsory).....	3
Steam boilers installed.....	44
Steam engines installed.....	16
Gas engines installed.....	11
Gasoline engines installed.....	1
Bake ovens erected.....	2
Buildings examined under the fire-escape law.....	162
Lights, gongs, and fire signals ordered in buildings.....	6
Heating apparatus examined.....	43
Miscellaneous condemnations.....	72
Total number of visits made.....	1,562

I respectfully call your attention to the recommendation in my last year's report, suggesting the following amendments to the building regulations, and again urge the adoption of the same:

"For a better and more uniform method of construction and erection of elevators, I have the honor to recommend that section 198 of the regulations governing elevators be amended by striking out all matter of said section and inserting in lieu thereof, so as to make section 198 read as follows:

"SEC. 198. It shall be unlawful for any person or persons, company or corporation, to construct or erect, or cause to be constructed or erected, any elevator to be used for carrying passengers or freight from one floor to another, in any building erected, or that may be in the course of erection, without making application for permission therefor to the inspector of buildings; and before the inspector of buildings shall grant permission for the erection, construction, or use of such elevator, there shall be filed in his office, as a matter of record, plans and specifications showing the type and make of machine and motive power to be used, and the size of all ropes, sheaves, drums, and supporting beams; also speed, travel, and capacity of car, type of safeties, dimension of pressure tank, and pressure carried thereon, or the number of volts and amperes of electric current and motor used.

"The inspector of buildings shall not grant the permission intended by this section for the erection of any elevator that may have less than two ropes of approved diameter, carrying the weight of the car and its load, or each counter-balance weight thereof."

"Also after the word 'use,' in the last line of section 200, insert the following: 'The said certificate shall be placed under glass and framed and hung in a conspicuous place in the car of the elevator for which the certificate was issued.'

"And after the word 'every' in the third line of section 202 the word 'three' be stricken out, and the word 'six' be inserted in lieu thereof.

"Also strike out all of section 207 except the schedule of sizes, and insert in lieu thereof the following:

"SEC. 207. It shall be unlawful for the owner or owners, in fee or for life, of any building in the District of Columbia to maintain or cause to be maintained

any elevator for carrying passengers in the said building unless such elevator have at least two hoisting ropes attached thereto and two ropes attached to counterweight used in connection with the elevator. All ropes will be indelibly fastened at their terminals.

"All doors approaching elevator shafts shall have safety locks of approved make, so that said doors will be closed when the elevator car is not at the place where the said doors are located."

"I deem it advisable to urge the adoption of the foregoing amendments, because the regulations now in force are not sufficiently stringent to properly govern the construction and erection of elevators in the District of Columbia. This office has no record of the sizes of ropes, types of safeties, etc., in relation to elevator in use. Heretofore the construction has been so at variance and very little given to consider the carrying capacities of the car, the weights to be sustained, etc., that it has been practically impossible to get a uniform elevator service. I believe the amendments here submitted will materially assist in facilitating regular inspections."

"The rapid increase in the number of elevators is making it practically impossible for one man to visit all the plants once in three months and make the necessary critical inspections to insure public safety."

I would respectfully call attention to the fact that so much of the time of the elevator inspector is now occupied in locating and inspecting heating apparatus, machinery, etc., that it is not possible for him to give the elevator service the attention necessary for the proper protection of the public safety. I would therefore recommend that a properly qualified person be appointed and assigned the duty of inspection of heating apparatus, machinery, etc.

I would also recommend that the regulations governing elevators, fire escapes and the location of machinery, heating apparatus, etc., be published in a separate volume, that will be smaller and much more convenient and serviceable for use of those connected with these branches of work.

Thanking you for the many courtesies shown me in the performance of my official duties, and believing that the recommendations herein will tend to improve the efficiency of this department and better insure the public safety, I am,

Very respectfully, yours,

A. M. LAWSON,  
Inspector of Elevators

Mr. JOHN B. BRADY,  
Inspector of Buildings, District of Columbia.

#### REPORT OF THE SUPERINTENDENT OF REPAIRS.

WASHINGTON, September 24, 1901.

CAPTAIN: I have the honor to submit herewith a statement explanatory of the work accomplished during the fiscal year 1901, and showing as far as possible how the various appropriations for repairs to municipal buildings were expended.

The greatest portion of the work was done in the summer months of August, and September, when the pay rolls carried more than 100 names. The kinds of repair work, such as carpentering, painting, tinning, paving, grouting, whitewashing, plastering, etc., were accomplished by means of day-labor, the kalsomining, steam fitting, mill and iron work were done under contract with local firms.

The appropriation of \$50,000 for "Repairs to school buildings, 1901," was distributed as follows:

Name of school.	Amount expended.	Name of school.	Amount expended.
First division:		Second division:	
Thomson .....	\$65.47	Seaton .....	
Franklin .....	3,552.51	Polk .....	
Phelps .....	386.70	Abbot .....	
Dennison .....	673.87	Henry .....	
Force .....	860.64	Eckington .....	
Adams .....	332.81	Webster .....	
Harrison .....	265.60	Twining .....	
Berret .....	117.90	Morse .....	
Total .....	6,205.30	Total .....	

OPERATIONS OF THE ENGINEER DEPARTMENT, D. C. 153

Name of school.	Amount expended.	Name of school.	Amount expended.
<b>Third division:</b>		<b>Seventh division—Continued.</b>	
Hilton.....	\$674.35	Brookland.....	\$326.68
Manry.....	655.80	Ivy City.....	148.50
Wallach.....	501.80	Monroe.....	445.80
Brent.....	159.56	<b>Total.....</b>	<b>2,718.14</b>
Carbery.....	523.90		
Lenox.....	355.12	<b>Eighth division:</b>	
Towers.....	324.81	Tyler.....	157.48
Peabody.....	965.16	Buchanan.....	308.40
McCormick.....	108.67	Cranch.....	214.59
<b>Total.....</b>	<b>4,263.17</b>	Van Buren.....	355.90
		Van Buren Annex.....	90.45
<b>Fourth division:</b>		Congress Heights.....	126.80
Greenleaf.....	185.48	Garfield.....	79.22
Potomac.....	221.78	Good Hope.....	48.05
Smallwood.....	85.53	Birney.....	196.03
Amidon.....	154.32	Burrville.....	168.68
Bradley.....	499.12	Bennings.....	46.70
Jefferson.....	1,456.02	Bennings Road.....	32.25
<b>Total.....</b>	<b>2,602.25</b>	Hubbard.....	968.25
		<b>Total.....</b>	<b>2,792.89</b>
<b>Fifth division:</b>			
Grant.....	870.91	<b>Ninth division:</b>	
Fillmore.....	46.45	Briggs.....	346.87
Curtis.....	1,125.06	Sunner.....	1,185.35
Threlkeld.....	169.90	Magruder.....	476.22
Corcoran.....	149.85	Stevens.....	551.80
Addison.....	369.64	Phillips.....	82.89
Jackson.....	73.75	Garrison.....	290.47
Weightman.....	227.75	Wormley.....	112.40
Toner.....	84.50	<b>Total.....</b>	<b>3,046.00</b>
High Street.....	128.22		
<b>Total.....</b>	<b>3,276.03</b>	<b>Tenth division:</b>	
		Cook.....	226.98
<b>Sixth division:</b>		Garnet.....	1,304.59
Arthur.....	553.87	Patterson.....	140.70
Blake.....	172.48	Slater.....	538.68
Hayes.....	482.94	Bannaker.....	663.80
Blair.....	470.47	Jones.....	235.88
Madison.....	606.46	Douglas.....	128.81
Pierce.....	144.91	Logan.....	723.58
Taylor.....	182.05	<b>Total.....</b>	<b>4,012.86</b>
Hamilton.....	168.58		
Langdon.....	114.25	<b>Eleventh division:</b>	
Gales.....	396.20	Lincoln.....	384.20
<b>Total.....</b>	<b>3,294.21</b>	Randall.....	296.90
		Bell.....	300.24
<b>Seventh division:</b>		Giddings.....	241.11
Reservoir.....	65.80	Bowen.....	21.28
Chain Bridge.....	18.50	Ambush.....	397.34
Conduit Road.....	23.50	Lovejoy.....	4.40
Tenley.....	372.84	Payne.....	291.71
Chevy Chase.....	26.91	<b>Total.....</b>	<b>1,937.18</b>
Grant Road.....	19.00		
Brightwood.....	80.00	<b>High schools:</b>	
Brightwood Road.....	49.50	Central.....	2,236.14
Johnson.....	478.28	Western.....	1,124.28
Johnson Annex.....	92.95	Eastern.....	550.84
Wilson.....	130.96	Business.....	322.82
Mott.....	264.46	Colored.....	546.98
Bruce.....	142.26	<b>Total.....</b>	<b>4,781.06</b>
Fort Slocum.....	20.00		
Woodburn.....	17.70		

SUMMARY.

Total accounted for.....	\$43,204.15
Horse and driver.....	707.60
Office salaries.....	2,003.75
Salary of Inspector of Janitors.....	646.75
Hardware, lumber, etc., in stock.....	2,000.00
Miscellaneous and emergency work.....	1,437.75
<b>Total.....</b>	<b>50,000.00</b>

## 154 OPERATIONS OF THE ENGINEER DEPARTMENT, D. C.

One hundred and ten school buildings, city and suburban, received attention, but on account of the limited appropriation all the requests of each school could not be met, only the most pressing needs being cared for.

Two hundred and fifteen orders were given for repairs to plumbing, amounting to \$2,435.16 (charged to "Repairs to plumbing public schools, 1901").

The appropriation of \$4,500 for "Repairs to engine houses, 1901," was expended as follows:

Engine No. 1.....	\$414.09	Engine No. 13.....	\$204.71
Engine No. 2.....	41.09	Engine No. 13.....	112.19
Engine No. 4.....	97.63	Engine No. 14.....	20.26
Engine No. 5.....	116.81	Engine No. 15.....	200.96
Engine No. 6.....	268.16	Chemical No. 1.....	74.24
Engine No. 7.....	337.93	Truck A.....	79.06
Engine No. 8.....	306.01	Truck B.....	92.26
Engine No. 9.....	230.68	Truck C.....	19.13
Engine No. 10.....	176.49	Truck D.....	419.29
Engine No. 11.....	470.65	Truck E.....	24.00

### SUMMARY.

Total accounted for.....	\$3,998.00
Office salaries and supplies.....	110.00
Extra and emergency work.....	401.41
<b>Total.....</b>	<b>4,500.00</b>

These repairs consisted in part of new granolithic floors, new stalls, plumbing, tinning, painting, and carpentering, but here, also, owing to the small appropriation, all the houses could not be repaired in a thorough manner.

The appropriation of \$5,000 for "Repairs to police stations, 1901," was expended as follows:

Station No. 1.....	\$334.69	Station No. 6.....	\$154.85
Station No. 2.....	703.29	Station No. 7.....	383.83
Station No. 3.....	994.01	Station No. 8.....	332.39
Station No. 4.....	379.10	Station No. 9.....	421.42
Station No. 5.....	306.74	Anacostia Substation.....	27.00

### SUMMARY.

Total accounted for.....	\$3,984.32
Salaries and stock on hand.....	350.00
Extra and emergency work.....	715.68
<b>Total.....</b>	<b>5,000.00</b>

The repairs here made were mainly of the same character as those for schools and engine houses.

The appropriation of \$2,250 for "Repairs to markets, 1901," was expended as follows:

Eastern.....	\$359.33
Western.....	1,898.33
Georgetown.....	17.95

### SUMMARY.

Total accounted for.....	\$1,775.00
Extra and emergency work.....	324.40
Salaries and stock on hand.....	150.00
<b>Total.....</b>	<b>2,250.00</b>

In addition to the work done under the above-mentioned appropriations, the annual appropriation of \$800 was expended on repairs to the Police Court. Repairs were also made at the Smallpox Hospital, District of Columbia Building, Industrial Home School, Property Yards, House of Detention, etc., amounting to more than \$3,000.

Respectfully,

G. B. COLEMAN,  
Superintendent of Repairs.

Capt. LANSING H. BEACH.  
Corps of Engineers, U. S. A.,  
Engineer Commissioner District of Columbia.  
(Through Captain Harding.)

## REPORT OF THE INSPECTOR OF ASPHALT AND CEMENTS.

WASHINGTON, July 25, 1901.

CAPTAIN: The work of testing done in this office during the fiscal year ending June 30 may be summarized as follows:

*Testing.*

Hydraulic cements:	
Natural, brands 8, samples.....	5,315
Portland, brands 5, samples.....	6,610
Asphalts:	
Trinidad, crude, 6 cargoes, samples.....	40
Trinidad, refined.....	6
Asphaltic cements, samples.....	111
Residuum oils.....	26
Surface mixtures.....	107
Miscellaneous asphalts.....	95
Sands.....	15
Gravels.....	6
Gasolines.....	6
Bricks.....	105
Waters.....	25
Oils.....	9
Miscellaneous, experiments, etc.....	60
Total.....	12,533

## HYDRAULIC CEMENTS.

The number of barrels inspected and the average results of tests of each brand of cement will be found in the following tables.

*Natural cements.*—The 5,315 samples represent 53,101 barrels, of which 7,498 barrels were rejected.

*Natural cements.*

Brand.	Number of barrels.	Number of samples.	Per cent residue, 100-mesh sieve.	Initial set, minutes.	Per cent water used.		Temperature of air and water ° F.	Tensile strength.		
					Neat cement.	3 parts sand.		Neat cement.		3 parts sand, 7 days.
								1 day.	7 days.	
Cumberland .....	5,297	529	18	19	30.3	14.4	74	154.9	216.3	152
Cumberland and Potomac .....	3,114	311	16.7	14	31.6	14.5	75	155	255.2	161.5
Cumberland Valley .....	18,787	1,878	18	19	30.7	14.3	75	101	108	81.6
Potomac .....	19,149	1,914	15.6	19.1	32.8	14	75.7	89.3	147	85.5
Round Top .....	4,114	411	18.6	16	30	14	77.5	113	195	121
Shepherdstown .....	130	13	9	19	31	14	73	87	106	107
Shield .....	1,591	159	10	66	25	12	72	146	217	120
Union .....	919	100	9	15	29	13	74	109	160.3	103.3

*Portland cements.*—The 6,610 samples of Portland cement represent 66,118 barrels, of which 5,018 were rejected.

*Portland cements.*

Brand.	Number of barrels.	Number of samples.	Per cent residue. 100 mesh sieve.	Initial set.	Per cent water used.		Temperature of air and water.	Tensile strength.		
					Neat ce- ment.	3 parts sand.		Neat cement.		3 parts sand, 7 days.
								1 day.	7 days.	
Atlas	11,308	1,130	7.5	<i>h. m.</i> 22 33	18	8.6	75	553.4	816.1	300
Lehigh	17,290	1,729	8	22 40	18.5	9	75	382.9	827.5	319.4
Nazareth	3,335	333	5	23 00	19	8	73	355.5	731	257.5
Star	7,100	710	11	22 00	20	8.3	80	480.5	640.3	251
Vulcanite	27,115	2,711	7.8	22 20	20	9	78	394.5	829.5	320

## ASPHALT PAVING.

The contract to lay asphalt pavements for the past fiscal year was awarded to the Barber Asphalt Paving Company. Trinidad Lake asphalt was used exclusively in this work.

Work has also been done by the Cranford Paving Company under their contract for repairing asphalt pavements.

The Trinidad Lake asphalt, as formerly, has been imported by the Barber Asphalt Paving Company in the crude state, and refined and manufactured into paving cement for their own use and that of the Cranford Paving Company.

During the past year 40 samples of the crude Trinidad asphalt have been received, representing 6 cargoes. The asphalt received has been uniform in composition, as in former years, the maximum, minimum, and average being, respectively, 53.78, 52.34, and 53.31 per cent bitumen soluble in carbon disulphid.

It is to be regretted that this asphalt is so badly acted on by the water, and it is no exaggeration to say that nine-tenths of the repairs that have to be made to the Trinidad pavements are made necessary by the destruction of this asphalt by moisture.

This disintegration has been proven without a doubt to be due to the presence of soluble salts in the asphalt left there from the evaporation of the concentrated mineral water that makes up nearly one-third of the crude asphalt.

Mr. Clifford Richardson, in his report to the Engineer Commissioner of the District of Columbia for the year ending June, 1890, says of this water:

"It has all the characteristics of a strong thermal water and contains over 2 per cent of salts in solution. It is acid in reaction, effervescing strongly with carbonates. \* \* \* The effect of this acid water can not be a desirable one upon the bitumen nor the presence of such a large proportion of salts which in one of the large stills must amount to about a quarter of a ton of common salt and sodium sulphate."

Mr. W. S. Wilkinson, president of the International Paving Company, says, in speaking of his experiments to render Trinidad Lake asphalt unacted on by water:

"I have found that when what is known as dried or refined asphalt, which has been produced from a crude asphalt containing appreciable percentages of soluble salts and nonbituminous organic matter (which are not eliminated in the process of drying or so-called refining, and are therefore found in an increased percentage to the whole in the dried or refined asphalt) is for some hours immersed in water it will begin to exhibit disintegration and the formation of a scum or detritus upon its surface, and that this disintegration will continue for some hours to an apparently constantly increasing extent, but that in the course of a few days at most it will nearly, if not quite, cease.

"I have further found that if this soft detritus be gently scraped off with a dull-edged instrument, and the refined or dried asphalt be then replaced in water, the same action will immediately begin, and that, after further immersion for a corresponding period, an equal quantity of detritus will be formed, and further that if the operation be repeated sufficiently often, the entire mass of the original piece of asphalt will be disintegrated and changed into the form which I have termed scum or detritus. This scum or detritus has hitherto been regarded as decayed or destroyed asphalt, worthless for useful purposes.

"I have, moreover, found that the asphalt is not only not in the slightest degree injured by this breaking up of its structure, but that upon the contrary its worst, if not its only detrimental elements are removed from it by the action of the water, and that if the detritus be melted, the resulting agglomerate will be a better and a more refined asphalt than that from which it itself was derived.

"In proof of this assertion it is only necessary to place a piece of the remelted detritus in water, and it will be found that it is not only not affected at all, but that the surface will for an indefinite period remain 'bright' and clean."

The complaints of pavements rotting from water is heard from many sources and the difference between Trinidad and the other asphalts is now well recognized in this respect. Numerous plans have been devised to take the water from such pavements and keep them as dry as possible, such as putting in brick gutters and putting blind drains under the concrete base when the subgrade is likely to be wet. But now that it has been practically demonstrated that the cause for the rotting of the asphalt can be removed by a lately devised process with but a slight addition to the expense of refining, it is only proper that we should require the same to be done before allowing the asphalt to be used.

I would recommend the insertion of a clause in the specifications for asphalt paving for the next fiscal year requiring that the asphalt cement should be practically unacted on by water.

*Petroleum residuum.*—During the year 26 samples of residuum oils were received

to be used as fluxes for asphalts, assigned as follows: Barber Asphalt Paving Company, 23; Cranford Paving Company, 3.

During the first part of this fiscal year the residuum furnished to the Barber Asphalt Paving Company was received from the refinery of the Standard Oil Company situated at Lima, Ohio. This residuum has been used here for the past few years, but it has not been satisfactory owing to its containing large quantities of solid paraffin, which necessitated the addition of large quantities of the residuum in fluxing the asphalt to obtain a cement of sufficient softness. On a complaint made a few months ago from this office the above company changed the source of supply of their residuum and are now receiving it from the Standard Oil Company refinery situated at Constable Hook, New Jersey. This new residuum is derived from the Pennsylvania oils and is much more fluid, while at the same time loses but little more on heating at high temperatures than does the residuum from Lima, Ohio.

Where it took 23 pounds of the old residuum to 100 pounds of refined Trinidad Lake asphalt to produce a desirable paving cement, we now make as soft a cement with but 19 pounds of the new residuum to the 100 pounds of refined asphalt, and the latter cement is of better quality, being less susceptible to changes in temperature and more ductile.

*Asphalt cements.*—The results of the tests made on the samples of asphalt cements received during the year will be found in the following table:

*Penetrations of asphalt topping and binder during fiscal year ending June 30, 1901.*

	Topping.				Binder.			
	Number of samples.	Penetrations.			Number of samples.	Penetrations.		
		High-est.	Low-est.	Aver-age.		High-est.	Low-est.	Aver-age.
Barber Asphalt Paving Co.....	25	50	38	42.5	2	80	73	76.5
Cranford Paving Co.....	82	52	34	41.1	2	82	84	83

*Asphalt surface mixtures.*—During the past year 107 samples were submitted by the two paving companies. The following table shows the maximum, minimum, and average per cent bitumen found in the surface mixtures, and also the average mesh composition of the sands used in same during the year.

	Barber Asphalt Paving Co.	Cranford Paving Co.
Number of samples.....	25	82
Average per cent bitumen.....	10.97	11.4
Lowest per cent bitumen.....	10	9.9
Highest per cent bitumen.....	12.4	12.5
Sand: Per cent retained on sieves having—		
20-mesh per linear inch.....	7.5	4.6
40-mesh per linear inch.....	23.3	34.9
60-mesh per linear inch.....	20	34.9
80-mesh per linear inch.....	17	13.3
100-mesh per linear inch.....	11.3	7
Passing 100-mesh per linear inch.....	20	16.2

*Miscellaneous asphalts.*—Under this heading is included a collection of 91 samples of asphalts presented by the United States Geological Survey; samples of refined asphalt and asphalt flux presented by the Globe Asphalt Company, of Pittsburg, Pa.; sample of refined asphalt and asphalt cement presented by the Warner Quinlan Asphalt Company, of Syracuse, N. Y., and samples of crude asphalt and asphalt flux presented by the Brennan Construction Company, of Washington, D. C.

The 91 samples of asphalt presented by the Geological Survey are specimens collected by George H. Eldridge, field geologist, during his recent investigation of the asphalt deposits of the United States and represent the average run of these various deposits. Work is in progress on this collection, but the examination is hardly completed as yet.

The samples of refined and liquid asphalt presented by the Globe Asphalt Company are from Obispo, Cal. The laboratory examinations indicates that a proper mixture of the refined and flux will produce a paving cement that will prove one of the best on the market.

The sample of refined asphalt presented by the Warner Quinlan Company was

refined from the Trinidad land asphalt at the refinery of this company at Tuley Point, N. J. An examination of an asphalt cement made by fluxing asphalt with a good quality of petroleum residuum showed it to be equal in quality to the asphalt cement used in paving in the District of Columbia during the past few years.

The sample of crude asphalt presented by the Brennan Construction Company is mined near Bejucal, about 20 miles from Havana, Cuba, by the West Indies Company, of New York, while the asphaltic flux is manufactured by the Sun Refining Company, of Obispo, Cal. A proper combination of this asphaltic flux produce a cement that from all indications will rank among the best for paving.

No really new methods for the examination of asphalt have developed during the past year, but considerable attention has been given to the perfecting of the further development of tests that time has proven of practical value for the comparison and rating of asphalts for paving.

I am of the belief that it will not be long before we will be able to fix numerical standards in our specifications that will insure the selection of a suitable pavement cement. I say this because it is pretty well understood what is required, and tests for these requirements are being worked up in a satisfactory manner.

(1) We know that we require a pavement cement that will be so ductile that it will permit the contraction of the pavement without cracking;

(2) That at the same time the cement must not be so softened by the maximum temperature of the climate that would make a pavement that would roll or break badly in summer;

(3) This cement must be able to withstand the heating to which it will be subjected in the process of manufacture of the pavement without having its physical properties materially changed; and

(4) That this cement should not be so rapidly changed with aging as to produce a pavement that would be injuriously hardened in an unreasonably short time.

When these four points can be accurately determined and a numerical standard specified for each, we will then be able to write satisfactory specifications for asphalt paving cement.

The first point can be ascertained by determining the ductility of the cement at low temperature. This test has not as yet been satisfactorily developed, there is every reason for believing that it will be in the near future. The second point, the softening of a cement at high temperature, can be accurately determined by ascertaining its penetration at a high temperature. The third change brought about by more or less prolonged heating in the consistency of a cement, can be determined by exposing cements under examination to a high temperature for some fixed time and always under the same conditions. The fourth, the aging of the cement, is still determined by the method given in my report for the fiscal year ending June 30, 1897. This method is very unsatisfactory, and not, of course, practical if you are limited to time, but I am of the belief that more expeditious method will shortly be obtained.

I will here repeat what I said several years ago, that the so-called chemical examinations or tests by solution in different solvents on asphalts are absolutely worthless, with our present knowledge, as a means of indicating the suitability of an asphalt or asphalt cement for paving. It is possible to have several asphalt materials which would all show on analysis the same percentage of the so-called retene, petrolene, and asphaltine, and yet would all differ materially in their physical properties. It is true that the per cent of petrolene in different samples of the same asphaltic cement will indicate approximately the consistency of the cement, but why resort to this test which has to be worked with the greatest care to insure anything like concordant results and take several days to execute when the information sought after can be ascertained with greater accuracy in less than an hour by means of the penetration test.

#### A SIMPLE FORM OF PENETRATION MACHINE.

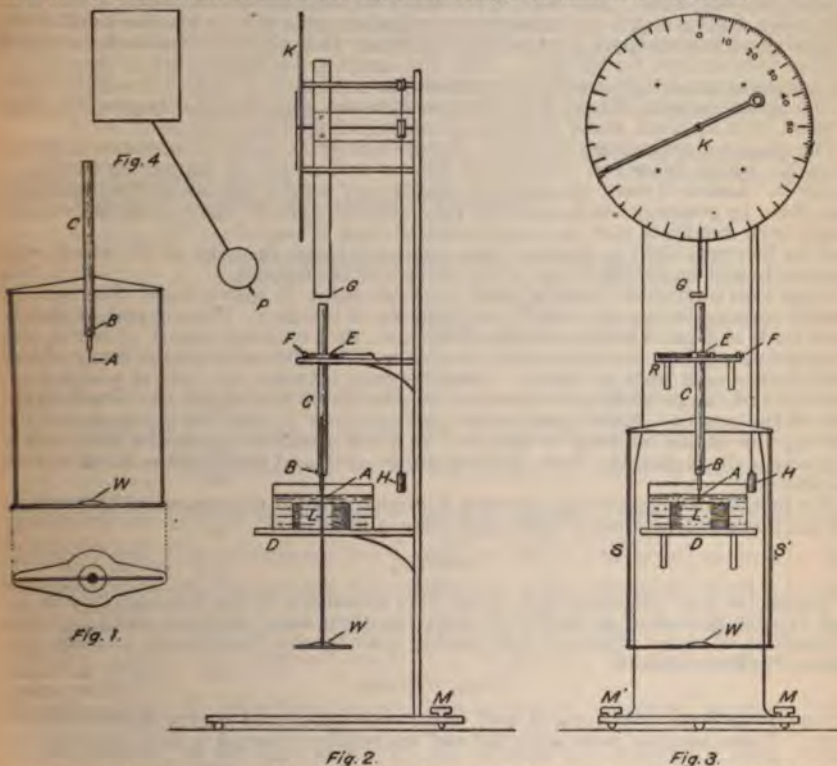
In a previous report (Report of the Operations of the Engineer Department of the District of Columbia for year ending June 30, 1898, p. 127) a new apparatus was described for determining the penetration of asphaltic cements. This apparatus differed from the old Bowen penetration machine in that the tests were made under conditions and with standards of time, weight, and measurement that could be easily duplicated, thus insuring concordant results with all machines constructed on the same general principle. This apparatus as described has proved very useful for the laboratory in experimental work and when great accuracy was necessary in the comparison of several samples of cement, but it was recognized as being too cumbersome and as requiring too great care in manipulation to answer

a machine that would be practical at a paving yard in the hands of a busy foreman or his assistant. A much simpler machine was designed about two years ago to fill this want and being constructed on the principle of the other, thus allowing the use of the same standards, the two machines give results that are concordant. Machines of this type have given such satisfaction in the hands of inspectors at the paving yards in this city and at several paving yards and cities that a description may prove of interest.

The standards that I have adopted with this machine are: Test made at a temperature of 32° F. or lower; the distance in one-hundredths of a centimeter that a No. 2 needle will penetrate into the sample in one minute of time when weighted with 200 grams. For tests made at a temperature of 77° F.; the distance in one hundredths of a centimeter that a No. 2 needle will penetrate into the sample in five seconds of time when weighted with 100 grams. For tests made at a temperature of 100° F., or above; the distance in one-hundredths of a centimeter that a No. 2 needle will penetrate, in five seconds of time weighted with 50 grams.

The object of the penetration test is to ascertain the softness of asphalt, etc., and is accomplished by determining the distance a weighted needle will penetrate into the specimen under examination.

If it is desirable that all tests be comparable, a standard needle should be used weighted with a definite weight. The tests should be made on samples at a standard temperature and be made for the same length of time in every case.



In fig. 1 is shown the No. 2 needle, A, inserted in a short brass rod which is held in an aluminum rod, C, by the binding screw, B. The aluminum rod is secured in a framework so weighted and balanced that when it is supported on the point of the needle, A, the framework and rod will stand in an upright position, allowing the needle to penetrate perpendicularly without the aid of a support.

The frame, aluminum rod, and needle weigh 50 grams; additional weight, when desired, are screwed on the bottom of the frame at W.

In figs. 2 and 3 are shown the side and front views of the entire apparatus put together and ready for making a penetration. D is a shelf for the sample. E is a clamp to hold the aluminum rod, C, until it is desired to make the test. F is a button which when pressed opens clamp, E. By turning this button while the clamp is being held open, it will lock and keep the clamp from closing until unlocked. The device to measure the distance penetrated by the needle consists of a rack, the foot of which is G. The movement of this rack up or down turns a pinion to which is attached the hand which indicates on the dial, K, the distance

moved by the rack. One division of the dial corresponds to a movement of the of one one-hundredth of a centimeter. H is a weight hung by a coarse thread which winds on a drum on the axle of the spindle and counterbalances the rack, so that the rack can be raised or lowered by moving this counterweight, H, up or down. L is the tin box containing the sample to be tested, which is covered with wax in a glass cup, thus keeping its temperature constant. M, M are leveling screws.

Fig. 4 represents a clock movement having a 10 inch pendulum attached to the wall to one side of the machine, used for timing the test.

Make a mark, P, on the wall just at the extremity of the swing of the pendulum. A double swing of this pendulum—that is, from the time it leaves P until it returns—is one second.

The only other things necessary to complete the outfit are a large dish pitcher to hold ice water, and a tin for hot water—an old coffeepot is a good thing.

To make penetration tests, place the materials contained in circular tins, with the glass dish, in the dish pan under 5 or 6 inches of water, which shall have been previously brought to the temperature desired by the addition of hot or cold water. While the samples are under the water it should be stirred a few minutes, best with a thermometer, and the temperature kept constant. If necessary by the addition of hot or cold water, as the case may require. The samples should remain under the water at least fifteen minutes, and in cases where they are very hot or cold or the temperature of the water is not near normal at least one-half hour. The most expeditious way to proceed in testing a sample just taken from a still is to immerse it in ice water as soon as it has hardened sufficiently and keep it there for ten minutes, when it is placed in the water of the desired temperature for the test. After the samples have remained in the water for sufficient time, they are ready to penetrate.

One of the samples should now be placed in the glass cup and removed. The cup should be covered with as much water as convenient without spilling.

The glass cup containing sample is placed on shelf D, under C, as shown in Figs. 2 and 3. Insert brass rod with needle into C and secure by tightening binding screw B. Lower C until the point of needle very nearly touches surface of sample; then, by grasping the frame with two hands at S and S, fig. 3, cautiously push down until needle is just in contact with surface of sample. This can be seen by having a light so situated that looking through the sides of the glass cup the needle will be seen reflected in the surface of the sample.

After thus setting the needle, raise counterweight H slowly until the foot of rack G rests on the head of rod C; note reading of the dial. Place thumb of left hand on R and press button F with forefinger, thus opening clamp. Hold for the desired time, and then allow it to close. Raise counterweight H as before until foot of rack rests on rod C. The difference between the former reading of the dial and the present is the distance penetrated by the needle, or the penetration of the sample. Raise rack, loosen binding screw B, raise rod through clamp leaving the needle sticking in sample. Remove needle from sample, clean by passing through a dry cloth, replace needle in C, and the machine is ready for another test.

For further information on this test I would refer to the reports of this department for the years ending June 30, 1897, and June 30, 1898.

#### BRICKS.

During the year 105 samples of brick were submitted by the building inspector and superintendent of bridges, and determinations were made on them for percentage of water absorbed and specific gravity, and the reports made to the respective departments.

#### WELL WATERS.

During the year 25 samples of well water were submitted by the water department. These samples were analyzed and the results reported to that department.

#### MISCELLANEOUS SAMPLES.

Under this head are included, among other things, some tests on the effect of freezing under different conditions on both natural and Portland cement mortar. It was found that less harm is done to cement than is generally supposed. Other tests are under way and will be reported when the results are more complete.

Very respectfully,

A. W. Dow,

*Inspector of Asphalt and Cement*

Capt. LANSING H. BEACH,

*Corps of Engineers, U. S. A.,*

*Engineer Commissioner District of Columbia,*

REPORT OF THE ASSISTANT ENGINEER IN CHARGE OF STREET  
EXTENSIONS.

WASHINGTON, August 7, 1901.

SIR: I have the honor to submit the following report of the work of this office for the fiscal year ended June 30, 1901:

Work of preparing plans for a permanent system of highways having been during the latter part of the fiscal year 1900, it was then found necessary to increase the street-extension force, and during the past year the work of this office has been done by myself and one assistant. All field work pertaining to the permanent system of highways is now performed by the surveyor of the District of Columbia, and the preparation of maps and data for condemnation proceedings is based on surveys formerly made under my directions.

During the past year juries have passed and reported on the following extensions authorized by various acts: Columbia road extended east of Thirteenth street; widening of Columbia road and old Sixteenth street; the extension of Sixteenth street; the extension of Howard avenue; the extension of Sixteenth street in Morris street to the District line.

Plans, special maps, and calculations relating to these extensions were prepared in this office for the use of the juries in these proceedings.

Studies relating to proposed highways or the opening of new streets have been made from time to time as circumstances have required.

Maps drawn to a scale of 1 inch to 100 feet, which were formerly completed by the surveys of this office and from records in the office of the surveyor of the District of Columbia, have been brought to date and a contract made for lithographing 75 of the number.

A summary table is submitted as information relating to the condemnation proceedings in streets and avenues covering a period of the last two fiscal years.

Very respectfully,

WM. P. RICHARDS,  
Assistant Engineer.

HANSING H. BEACH,  
Engineer Commissioner District of Columbia.

Street extension condemnations for two years.

City.	Act.	Date of award.	Date of confirmation.	Damages.	Benefits.	Court file.
Howard avenue.	No. 43, approved Feb. 10, 1899.	1899. Dec. 1	1900. Jan. 27	\$98,617.00	\$48,808.50	544
Thirteenth street.	No. 73, approved Feb. 25, 1899.	Feb. 25	1899. Oct. 30	64,000.00	32,000.00	537
Decatur street.	No. 186, approved Mar. 3, 1899.	Aug. 30	1899. Nov. 18	52,000.00	26,000.00	549
Thirteenth street.	No. 225, approved Mar. 3, 1899.	June 12	1900. July 21	7,000.00	3,500.00	546
Thirteenth street.	No. 185, approved Mar. 3, 1899.	Feb. 16	1900. July 3	209,120.00	134,565.00	556
Howard avenue.	No. 225, approved Mar. 3, 1899.	May 1	( <sup>1</sup> ) 1901. July 8	154,587.00	77,293.50	555
Thirteenth street.	No. 186, approved Mar. 3, 1899.	June 2	1901. July 8	100,791.96	50,396.00	557
Thirteenth street.	No. 181, approved June 6, 1900.	Aug. 1	Mar. 20	29,612.64	14,830.00	574
Columbia road.	No. 182, approved June 6, 1900.	Sept. 27	July 9	181,858.00	90,929.00	577
Thirteenth street.	No. 225, approved Mar. 3, 1899.	Oct. 5	June 5	5,687.50	2,180.35	552
Howard avenue.	do	Nov. 8	June 27	6,462.00	3,526.00	547
Thirteenth street.	No. 186, approved Mar. 3, 1899.	1901. May 27		729,952.29	108,834.75	580
Howard avenue.	No. 225, approved Mar. 3, 1899.	July 24	( <sup>2</sup> )	1,939.00	1,019.00	551
do	do					554
				1,609,627.39		

<sup>1</sup> Hearing Sept. 6.

<sup>2</sup> Hearing Sept. 16.

## 162 OPERATIONS OF THE ENGINEER DEPARTMENT, D. C.

## REPORT OF THE SUPERINTENDENT OF PROPERTY.

WASHINGTON, August 23, 1901.

CAPTAIN: I have the honor to forward herewith detailed statements, as of July 1, 1901, showing the operation of the property division for the fiscal year ending June 30, as follows:

1. Construction materials purchased.....	\$301,235.32
2. Miscellaneous purchases.....	88,201.27
3. List of employees, other than those on the per annum rolls, and amounts paid to each from various appropriations.....	19,239.14
Total.....	\$408,675.73

Deliveries under contracts for furnishing curbing, sewer pipe, vitrified paving blocks, vitrified invert sewer bricks, paving and concrete and screened sand, screened gravel and natural cement are still in course of execution. The reports to these items is therefore incomplete.

Very respectfully,

R. D. SIMMS,  
Superintendent of Property.

Capt. LANSING H. BEACH,  
Corps of Engineers, U. S. A.,  
Engineer Commissioner District of Columbia.

STATEMENT NO. 1.—Showing amount of construction materials purchased and issued from the District of Columbia property yards during the year ending June 30, 1901.

	Quantities.	Values.
Terra-cotta sewer pipe, branches, bends and reducers:		
24-inch sewer pipe.....feet..	3,717	\$2,622.88
21-inch sewer pipe.....do.....	8,283	4,075.93
18-inch sewer pipe.....do.....	9,569	3,535.06
15-inch sewer pipe.....do.....	10,703	2,986.44
12-inch sewer pipe.....do.....	18,569	3,516.97
10-inch sewer pipe.....do.....	9,793	1,328.79
8-inch sewer pipe.....do.....	2,537	222.25
6-inch sewer pipe.....do.....	9,189	657.45
8-inch to 6-inch reducers.....number..	28	10.08
Vitrified sewer invert blocks.....feet..	1,997	708.60
Vitrified sewer invert bricks.....number..	468,566	7,848.47
Portland cement.....barrels..	14,051	31,455.94
Natural cement.....do.....	23,994	17,225.32
Castings.....number..	438	3,461.20
Water boxes.....do.....	350,715	3,910.47
Sidewalk paving bricks.....do.....	392,219	20,865.00
Asphalt paving blocks.....do.....	910,214	19,596.37
Repressed vitrified paving blocks.....do.....	153,003	2,142.04
Repressed vitrified paving half blocks.....do.....	3,785	1,891.92
Paving and concrete sand.....cubic yards..	402	251.18
Screened sand.....do.....	3,295	2,775.75
Screened pebbles.....do.....	113,808	80,671.59
Curbing.....linear feet..	44,928	44,029.25
Broken stone.....cubic yards..		24,192.99
Freight.....		9,993.95
Hauling.....		236.00
Bluestone basin tops.....number..	20	1,078.68
Storage on Portland cement.....		8,781.33
Red sewer bricks.....number..		
Total.....		\$301,235.32

STATEMENT No. 2.—Showing miscellaneous purchases made during the year ending June 30, 1901.

Awnings purchased and repaired.....	\$118.75	Mortar, lime, and hair.....	\$82.65
Anemometer.....	21.35	Maps, charts, and repairs to.....	227.40
Aquaphone.....	2.58	Oils, illuminating and engine.....	711.34
Blank forms, printing, and binding.....	2,450.01	Plumbers' supplies.....	4,538.12
Books made to order.....	728.58	Periodicals and publications.....	65.22
Boots, rubber.....	178.70	Photographic apparatus and material.....	119.64
Bicycle repairs.....	80.88	Pitch.....	604.12
Bridge material, iron, steel, and structural.....	491.63	Plows, and repairs to.....	139.08
Badges, and repairs to.....	184.00	Pumps.....	322.25
Blue prints.....	1,026.74	Paints, glass, and oils.....	4,024.92
Broken stone, flagging, etc.....	249.81	Rent, D. C. property yard.....	300.00
Bricks, insulating.....	80.00	Rent, warehouses.....	1,130.76
Castings.....	6,067.98	Repairs:	
Cement, asphalt.....	225.30	D. C. building.....	\$57.50
Cement, plumbers' and slaters'.....	64.17	U street pump house.....	167.00
Drugs and chemical apparatus.....	309.76	Damage 517 Eleventh street.....	21.00
Dry goods.....	32.62		245.50
Drafting instruments and materials.....	462.97	Railroad ties.....	184.95
Duplicator.....	6.00	Surveyors' instruments and repairs to.....	329.00
Dump cars.....	240.00	Stationery.....	1,667.03
Electrical supplies.....	1,971.63	Saddlery.....	603.63
Engine, machinery, etc.....	686.37	Steam roller, and repairs.....	62.12
Forage.....	7,090.04	Seeds, trees, etc.....	200.05
Fertilizer.....	78.90	Scales.....	130.35
Furniture, and repairs to.....	1,137.94	Tinware.....	1,800.68
Fuel.....	9,523.77	Typewriters and repairs.....	412.81
Groceries.....	47.46	Tools, and repairs to.....	2,411.93
Hardware.....	5,043.88	Tickets, street car.....	289.50
Hose and couplings.....	1,397.75	Valves and castings, water department.....	5,795.18
Horses.....	175.00	Wagons, carts, and buggies, and repairs to.....	2,612.16
Ice.....	65.66	Water meters.....	171.00
Lead, Omaha pig.....	3,583.20		
Lumber.....	14,508.85	Total.....	88,201.27
Leather strips.....	640.80		
Ladders.....	16.80		

STATEMENT No. 3.—Showing list of employees other than those on the per-annum rolls, amount paid to each, and the various appropriations from which such payments were made.

	Rate.	Assessment and permit work.		Improvement and repairs.	Cleaning and repairing sewers and basins.	Replacing obstructed sewers.	Main and pipe sewers.
		Streets.	Sewers.				
R. D. Simms.....	\$5.00	\$120.00	\$70.00	\$255.00	\$44.97	\$31.53	-----
C. T. Shoemaker.....	4.50	108.00	63.00	229.50	40.47	28.38	-----
J. A. McDannel.....	4.00	132.00	56.00	204.00	35.98	25.21	-----
H. M. Spencer.....	4.00	96.00	56.00	148.00	35.98	25.22	\$56.00
W. H. Edgar.....	3.50	84.00	49.00	129.50	31.48	22.08	49.00
H. B. vander Las.....	2.50	60.00	35.00	122.50	22.49	10.01	-----
Edward Morris.....	2.50	30.00	35.00	32.50	22.49	11.24	-----
William Donaldson.....	4.00	96.00	56.00	204.00	35.98	25.22	-----
H. M. Dickinson.....	3.25	78.00	84.55	123.50	29.23	20.50	14.40
W. J. W. Grey.....	3.00	69.00	45.00	120.00	26.98	12.02	-----
W. H. Voss.....	3.00	111.00	42.00	153.00	26.98	18.92	-----
G. T. Hammer.....	2.00	72.00	28.00	25.25	16.00	30.60	62.86
Blacksmiths.....	3.25 1.75 2.00	55.00	70.00	25.25	-----	11.41	156.29
Laborers.....	1.75 1.50	725.50	220.92	52.50	345.08	85.01	376.16
Total.....		1,836.50	910.47	1,824.50	714.71	357.35	714.71

164 OPERATIONS OF THE ENGINEER DEPARTMENT, D. C.

STATEMENT No. 3.—Showing list of employees, etc.—Continued.

	Rate.	Suburban sewers.	Arizona avenue sewer.	L. street sewer.	East side intercepting sewer.		Extension of Boundary sewer.	Separate
					Between Twenty-second and A NE. and Twelfth street SE.	From Twelfth street SE. to pumping station, foot of New Jersey avenue.		
R. D. Simms.....	\$5.00		\$95.12		\$28.58	\$23.12	\$27.93	
C. T. Shoemaker.....	4.50		85.61		25.72	20.81	25.14	
J. A. McDannel.....	4.00		76.09		22.87	18.50	22.34	
H. M. Spencer.....	4.00		76.10		22.86	18.49	22.35	
W. H. Edgar.....	3.50	\$91.00	45.50		11.76		19.56	
H. B. vander Las.....	2.50	32.50	47.56		5.88	11.56		
Edward Morris.....	2.50				1.80		3.00	
William Donaldson.....	4.00	52.00			13.45		22.35	
H. M. Dickinson.....	3.25	91.07		\$9.66	29.12	38.93	18.16	
W. J. W. Grey.....	3.00	42.07				35.93		
W. H. Voss.....	3.00	45.07			10.08	35.93	16.77	
G. T. Hammer.....	2.00	29.75		29.95	11.19	22.25		
Blacksmiths.....	1.75	68.25	37.38	99.61	46.07		27.73	
Laborers.....	1.75	264.71	251.35	289.60	199.45	203.30	80.59	
	1.50							
Total.....		716.42	714.71	428.82	428.83	428.82	285.92	

	Rate.	Repairs to streets, avenues, and alleys.	Sidewalks and curbs.	Construction of county roads.	Adams Mill road.	Extension of Columbia road, east of Thirteenth street.	Repairs to county roads.	Br
R. D. Simms.....	\$5.00	\$265.00		\$130.00				
C. T. Shoemaker.....	4.50	238.59		117.00				
J. A. McDannel.....	4.00	160.00		104.00				
H. M. Spencer.....	4.00	160.00		104.00		\$52.00	\$52.00	
W. H. Edgar.....	3.50	140.00		91.00			45.50	
H. B. vander Las.....	2.50	100.00		90.00			32.50	
Edward Morris.....	2.50	48.25		65.00			2.50	
William Donaldson.....	4.00	204.00		104.00				
H. M. Dickinson.....	3.25	84.50		42.25				
W. J. W. Grey.....	3.00	72.00		135.00		39.00		
W. H. Voss.....	3.00	78.00		78.00			39.00	
G. T. Hammer.....	2.00	25.25		96.00			25.25	
Blacksmiths.....	1.75	65.75	\$63.00				83.51	
Laborers.....	1.75	300.36	37.00	229.75	\$30.00	9.00	319.67	
	1.50							
Total.....		1,999.61	100.00	1,886.00	30.00	100.00	599.93	1

OPERATIONS OF THE ENGINEER DEPARTMENT, D. C. 165

STATEMENT NO. 3.—Showing list of employees, etc.—Continued.

	Rate.	Repairs and improvements to school buildings and grounds.	School buildings.	Special repairs to market houses.	Repairs to police stations.	Repairs to engine houses.	Repairs to police court.	Work-house for males.
R. D. Simms .....	\$5.00	\$25.00	.....	.....	.....	.....	.....	.....
C. T. Shoemaker .....	4.50	58.50	.....	.....	.....	.....	.....	.....
J. A. McDannel .....	4.00	52.00	.....	.....	.....	.....	.....	.....
H. M. Spencer .....	4.00	58.00	.....	.....	.....	.....	.....	.....
W. H. Edgar .....	3.50	.....	\$45.50	.....	.....	.....	.....	.....
H. B. vander Las .....	2.50	.....	32.50	.....	.....	.....	.....	.....
Edward Morris .....	2.50	.....	32.50	.....	.....	.....	.....	.....
William Donaldson .....	4.00	12.00	.....	.....	.....	.....	.....	.....
H. M. Dickinson .....	3.25	.....	42.25	.....	.....	.....	.....	.....
W. J. W. Grey .....	3.00	.....	59.00	.....	.....	.....	.....	20.00
W. H. Voss .....	3.00	.....	.....	.....	.....	.....	.....	39.00
G. T. Hammer .....	2.00	26.00	26.00	.....	.....	.....	.....	.....
Blacksmiths .....	3.25	.....	.....	.....	.....	.....	.....	.....
.....	1.75	.....	68.25	.....	\$24.00	.....	.....	.....
.....	2.00	.....	.....	.....	.....	.....	.....	.....
Laborers .....	1.75	7.88	160.00	\$10.59	.....	\$22.00	\$3.50	1.00
.....	1.50	.....	.....	.....	.....	.....	.....	.....
Total .....	.....	273.38	466.00	10.59	24.00	22.00	3.50	60.00

	Rate.	Extension of high-service system.	Pump-ing ex-pense and pipe distribu-tion.	Contin-gent ex-pense, engineer-stable.	Contin-gent ex-pense, parking commis-sion.	Street lighting.	Main-taining publicor-der, Feb. and Mar., 1901.	Totals.
R. D. Simms .....	\$5.00	\$135.00	\$60.00	.....	.....	.....	.....	\$1,560.00
C. T. Shoemaker .....	4.50	121.50	54.00	.....	.....	.....	.....	1,404.00
J. A. McDannel .....	4.00	108.00	48.00	.....	.....	.....	.....	1,232.00
H. M. Spencer .....	4.00	108.00	48.00	.....	.....	.....	.....	1,248.00
W. H. Edgar .....	3.50	94.50	42.00	.....	.....	.....	.....	1,062.00
H. B. vander Las .....	2.50	67.50	30.00	.....	.....	.....	.....	765.00
Edward Morris .....	2.50	35.00	30.00	.....	.....	.....	.....	371.25
William Donaldson .....	4.00	160.00	48.00	.....	.....	.....	.....	1,248.00
H. M. Dickinson .....	3.25	87.75	81.25	.....	\$42.25	.....	.....	1,010.80
W. J. W. Grey .....	3.00	41.00	75.00	.....	.....	.....	.....	870.00
W. H. Voss .....	3.00	81.00	36.00	.....	.....	.....	.....	897.00
G. T. Hammer .....	2.00	28.00	24.00	.....	.....	.....	.....	598.96
Blacksmiths .....	3.25	.....	.....	.....	.....	.....	.....	.....
.....	1.75	186.00	14.70	\$337.42	.....	\$68.25	\$35.11	1,566.64
.....	2.00	.....	.....	.....	.....	.....	.....	.....
Laborers .....	1.75	596.26	69.50	.....	5.50	106.75	39.79	5,365.50
.....	1.50	.....	.....	.....	.....	.....	.....	.....
Total .....	.....	1,849.51	660.45	337.42	47.75	175.00	74.90	19,229.14

# 166 OPERATIONS OF THE ENGINEER DEPARTMENT, D. C.

## REPORT OF THE PERMIT CLERK.

WASHINGTON, July 30, 1901

CAPTAIN: Permits issued during the fiscal year ended June 30, 1901, were:

Water connections .....	1,362
Water repairs .....	905
Water specials .....	291
Sewer connections .....	1,446
Sewer repairs .....	1,044
Sewer specials .....	878
Gas and electric light connections .....	946
Gas and electric light repairs .....	180
Gas and electric light specials .....	19
Gas mains, lay .....	
Electric conduits, construct and extend .....	
Electric conduits, connect with telephone .....	
Electric conduits, replace cables in .....	
Electric railroad conduits, connect with sewers .....	
Electric conduits, lay private in alley .....	
Catch basins, build on electric railroad .....	
Carriage step, place at curb .....	
Conduits, lower and repair (United States) .....	
Copings, erect and repair on parkings .....	
Derricks, operate and guy in roadway .....	
Drain pipes, lay and clear .....	
Fences, erect to inclose parkings .....	
Fences, repair to inclose parkings .....	
Excavations, make in public space .....	
Engines and steam shovels, move over streets .....	
Flagging stone, lay in public space .....	
Fire hydrants, use .....	
Drive-ways across sidewalk, construct and repair .....	
Gas service pipe, extend from building line .....	
Guard stones, place in alley .....	
Hand rail, place on terrace steps .....	
Hitching posts, place at curb .....	
Hitching rings, place in curb .....	
Leads, lay across parkings .....	
Leads, repair across parkings .....	
Lights, hang electric and gas .....	
Manhole, build on electric railway .....	
Material, take from and fill in public space .....	
Oil pipes, lower .....	
Parkings, grade .....	
Parkings, lay, remove, repair or replace pavement .....	
Parking, place platform on .....	
Pipes, lay under sidewalks .....	
Poles, erect, replace, and remove telegraph and telephone .....	
Roadways, pave, grade, and repair, etc .....	
Sewage-disposal plant, construct .....	
Sewer, enter .....	
Sidewalks, haul across .....	
Sidewalks, repair .....	
Sidewalks, occupy for business purposes .....	
Steps on parkings, erect, replace, or repair .....	
Stop-cock boxes, gas, adjust to grade .....	
Sockets, sink in sidewalk .....	
Track, lay temporary for loading cars .....	
Vaults, repair and replace cover .....	
Walls, build retaining, on parkings .....	
Water tables, lay and repair .....	
Wires, string .....	
Wires, overhead connections (U. S. E. and P. E. P. Co.'s) .....	
Wires, overhead telephone connections .....	

Wires, monthly to connect overhead and make repairs .....	158
Wires, miscellaneous .....	6
Trees, plant, remove, trim, and whitewash .....	25
Miscellaneous, not enumerated by name .....	48

RAILROAD COMPANIES.

Anacostia and Potomac River Railroad Company .....	6
Brightwood .....	2
Capital Railway .....	2
Capital Traction .....	11
City and Suburban .....	7
Columbia .....	1
Georgetown and Tenley .....	1
Metropolitan .....	4
Baltimore and Ohio .....	15
Philadelphia, Wilmington and Baltimore .....	9
Chesapeake and Ohio .....	1
Southern .....	1
Washington, Alexandria and Mount Vernon .....	1

UNITED STATES GOVERNMENT.

Architect, United States Capitol .....	1
Coast and Geodetic Survey .....	1
Department of the Interior .....	1
Superintendent State, War, and Navy Building .....	1
Post-Office Department .....	2
United States Navy-Yard .....	1
Washington Aqueduct (officer in charge) .....	1

Grand total ..... 10,522

There has been a decrease of 67 in the number of permits issued as compared with the fiscal year ended June 30, 1900; also in the amount of money paid in fees to the collector of taxes, District of Columbia, as will be shown by his report.

Permits issued during the fiscal year 1899-1900 .....	10,589
Permits issued during the fiscal year 1900-1901 .....	10,522

The following table shows the number of permits issued during the last five years, and the amount of money paid for permit fees to the collector of taxes, District of Columbia, during that time:

Fiscal year.	Permits issued.	Fees paid.
1896-97 .....	10,153	\$7,355
1897-98 .....	10,465	7,845
1898-99 .....	11,330	7,692
1899-1900 .....	10,589	6,797
1900-1901 .....	10,522	6,583

Nine hundred and ninety-nine communications have been referred to this office, briefs made on cards, the permits necessary written, the papers indorsed with action taken and returned to the record office of the engineer department, or through that office to the division having charge of the inspection of the work for which the permits were issued.

One hundred and twenty-five names were recorded for laborers' places on District work during the year.

Very respectfully,

H. M. WOODWARD,  
Permit Clerk, District of Columbia.

Capt. LANSING H. BEACH,  
Corps of Engineers, U. S. A.,  
Engineer Commissioner District of Columbia.

## REPORT OF THE CHIEF CLERK.

WASHINGTON, July 1, 1901.

CAPTAIN: I have the honor to submit the following report for the fiscal year ended June 30, 1901:

Communications received, briefed, and recorded . . . . .	11,915
Indorsements, references, and reports thereon . . . . .	56,573
Letters and orders prepared . . . . .	5,049
Copies of contracts drawn . . . . .	616
Vouchers and bills prepared and forwarded . . . . .	5,904

Schedules of bids received during the fiscal year for work and materials under the engineer office, and statement of contracts for street improvements, sewers, construction materials, and miscellaneous work are herewith.

Very respectfully,

A. Y. LAKEMAN,

Chief Clerk, Engineer Department, District of Columbia.

Capt. LANSING H. BEACH,

Corps of Engineers, U. S. A.,

Engineer Commissioner District of Columbia.

## Statement of contracts for the construction of sewers for the fiscal year 1901.

No.	Date.	Name and address of contractor.	Location.	To construct—
2329	Aug. 4, 1900	Andrew Gleeson . . . .	Piney Branch Valley, between Fifth and Chesapeake and Piney Branch road and Vermilion street.	Pipe sewers.
2337	Aug. 11, 1900	Warren F. Brenizer.	Arizona avenue, between Canal road and New Cut road, and also north from New Cut road.	Circular sewers.
2341	Aug. 13, 1900	Adam McCandlish . . . .	Sixteenth street NW., between K and L; K street NW., between Fifteenth and Sixteenth; Nineteenth street NW., between Q and R; Potomac Park, between river and Twenty-sixth street; Twenty-sixth street NW., between Water and D streets.	Pipe sewers.
2370	Sept. 26, 1900	P. D. Vinson . . . . .	Eighteenth street NW., between Q and Corcoran; New Hampshire avenue, between Corcoran and Elgar; S street NW., between Fourteenth and Fifteenth; Fourteenth street NW., between B and S; L street NW., between Sixteenth and Twentieth.	Pipe and brick sewers.
2389	Dec. 18, 1900	John Jacoby, Wilmington, Del.	From Seventeenth and E. NE., to near Twenty-first and A. NE.	Brick sewers.
2393	Jan. 31, 1901	Andrew Gleeson, Washington, D. C.	Tiber Creek and New Jersey avenue high-level intercepting sewer.	Gates, connections, and outlet section.
2398	Apr. 27, 1901	J. P. Larguey, Washington, D. C.	Nourse road, from Klinge Ford bridge to Connecticut avenue.	15-inch pipe sewer.
2399	.....do.....	M. F. McNamara & Co., Washington, D. C.	Twenty-fourth street NW., between Massachusetts avenue and Bancroft street.	2.50 by 3.75 egg-shaped sewer.
2399	.....do.....	M. F. McNamara & Co., Washington, D. C.	Connecticut avenue, from Nourse road to Pierce Mill road.	Sewers.
2399	Apr. 29, 1901	J. Jacoby, Wilmington, Del.	Howard avenue, Barry farm, from Anacostia River to Nicholas avenue and along Nicholas avenue northward.	Sewer.
2339	June 24, 1901	R. A. Malone & Co., Lancaster, Pa.	Hartford street, between Seventh and Ninth. NE.; and in Seventh, between Galena and Hartford streets; also in Arizona avenue, north of New Cut road.	Sewers.

*Statement of contracts for the construction of sewers, etc.—Continued.*

No.	Date.	Name and address of contractor.	Location.	To construct—
2940	June 29, 1901	Lyons Bros., Washington, D. C.	Fourteenth street N W., between N and Rhode Island avenue; also in Thirteenth street S W., between Band D.	Sewer.
2941	.....do.....	W. F. Brenizer, Washington, D. C.	M street N W., between Seventh and Ninth; alley, square 424; and Twelfth street S W., between D and Virginia avenue.	Sewers.
2942	June 28, 1901	Peyton D. Vinson, Washington, D. C.	North Capitol street, between G and K streets.	Sewer.

*Statement of contracts for improvement of streets, avenues, and roads for fiscal year 1901.*

No.	Date.	Name and address of contractor.	Location.	Character of work.
284	July 2, 1900	Washington Asphalt Block and Tile Co.	Where ordered .....	Lay asphalt block pavement.
293	July 23, 1900	Matthew Myers .....	Frankfort street, between Queens Chapel road and Twenty-second street, Langdon.	Grade.
2906	July 18, 1900	Washington Asphalt Block and Tile Co.	Where ordered .....	Grade, set curb, pave cobble gutters, and vitrified block gutters.
2808	July 6, 1900	Barber Asphalt Paving Co.	.....do.....	Lay sheet asphalt pavement.
2810	July 19, 1900	Andrew Gleeson .....	Woodbridge street .....	Grade.
2828	Aug. 4, 1900	Lyons Bros .....	Crescent street, from Sixteenth west.	Do.
2839	Aug. 9, 1900	M. F. Talty .....	Where ordered .....	Grade, set curb, pave, and repair cobble gutters, etc.
2842	Aug. 8, 1900	W. F. Brenizer .....	Cathedral avenue .....	Grade.
2854	Aug. 17, 1900	Geo. B. Mullin .....	Blagden avenue .....	Do.
2856	Aug. 23, 1900	R. A. Malone .....	Eleventh street extended, between Florida and Lydecker avenues.	Do.
2858	Aug. 25, 1900	Tait-Burrows Contracting Co.	Thirty-seventh street, between Y and Back streets.	Do.
2872	Oct. 6, 1900	Fredk. Drew .....	Thirteen street, between Harvard and Whitney; Kenyon street, between Thirteenth and Sherman; Marshall street, between Thirteenth and Sherman.	Lay cement sidewalks,
2882	Oct. 26, 1900	Colburn Paving Co., Washington, D. C.	Where directed .....	Lay cement sidewalks.
2899	Apr. 5, 1901	Andrew Gleeson .....	Adams Mill road, Cincinnati street to Zoological Park.	Grade.
2902	Apr. 11, 1901	J. C. Regan & Co .....	Connecticut avenue, west of Rock Creek.	Do.
2906	Apr. 22, 1901	.....do.....	Columbia road, Thirteenth street to Sherman avenue.	Do.
2911	Apr. 30, 1901	Barber Asphalt Paving Co.	Bladensburg road, from H street northward.	Lay standard asphalt.
2915	May 14, 1901	Andrew Gleeson .....	Nebraska avenue, between Newark street, Wesley Heights, and Vallejo street, Dumbane.	Grade.
2916	May 15, 1901	W. H. H. Allen .....	Illinois avenue, between Xenia street and Albemarle street, Petworth.	Do.
2918	May 21, 1901	Killeen & Ball .....	Blagden avenue to Rock Creek Park line.	Do.
2921	May 22, 1901	John Jacoby .....	Joliet street, between Wisconsin avenue and Tunlaw road.	Do.
2926	June 11, 1901	Washington Asphalt Block and Tile Co.	Where ordered .....	Lay asphalt block pavement.

## 170 OPERATIONS OF THE ENGINEER DEPARTMENT, D. C.

## Statement of contracts for general supplies for the fiscal year 1901.

No.	Date.	Name and address of contractor.	To furnish—
2798	July 9, 1900	Conrad Becker, Washington, D. C.	Saddlery.
2799	July 10, 1900	Chas. G. Stott & Co., Washington, D. C.	Stationery.
2791	July 19, 1900	Louis Hoppenmaier, Washington, D. C.	Pig lead.
2796	July 18, 1900	Geo. F. Muth & Co., Washington, D. C.	Hardware.
2797	July 12, 1900	Blum Bros., Washington, D. C.	House furnishings.
2798	do	do	Furniture, shading, etc.
2799	July 24, 1900	Rudolph West & Co., Washington, D. C.	Tinware.
2800	July 20, 1900	J. & M. Strasburger, Washington, D. C.	Boots and shoes.
2801	July 18, 1900	Geo. F. Muth & Co., Washington, D. C.	Glass, paints, and varnish.
2803	July 16, 1900	Church & Stephenson, Washington, D. C.	Lumber.
2811	July 23, 1900	Chas. White & Co., Washington, D. C.	Miscellaneous castings.
2812	July 26, 1900	American Ice Co., New York	Ice.
2813	July 24, 1900	Rudolph West & Co., Washington, D. C.	Hardware.
2815	July 27, 1900	Thos. Somerville & Sons, Washington, D. C.	Plumbers' material.
2821	July 30, 1900	J. S. Buchanan & Co., Philadelphia, Pa.	Electrical supplies.
2822	July 28, 1900	S. S. Daish & Sons, Washington, D. C.	Forage.
2823	July 21, 1900	T. T. Keane, Washington, D. C.	Fresh meat and corned beef.
2826	July 31, 1900	W. J. C. Dulany, Baltimore, Md.	School books.
2827	July 25, 1900	Mackall Bros., Washington, D. C.	Drugs.
2831	July 30, 1900	Standard Oil Co., Washington, D. C.	Oils, etc.
2832	Aug. 7, 1900	Dunlap Printing Co., Philadelphia, Pa.	Miscellaneous printing.
2834	July 11, 1900	Frank Hume, Washington, D. C.	Groceries.
2835	do	do	Liquors.
2840	Aug. 7, 1900	Dunlap Printing Co., Philadelphia, Pa.	Miscellaneous printing.
2843	Aug. 8, 1900	Chas. Werner, Washington, D. C.	Fuel.
2845	Aug. 7, 1900	Dunlap Printing Co., Philadelphia, Pa.	Blank forms.
2846	July 11, 1900	W. M. Galt & Co., Washington, D. C.	Flour.
2849	July 12, 1900	Blum Bros., Washington, D. C.	Dry goods.
2850	July 24, 1900	J. C. Ergood & Co., Washington, D. C.	Groceries, bacon.
2851	July 26, 1900	A. P. Smith Manufacturing Co., Newark, N. J.	Curb cocks, etc.
2861	Aug. 31, 1900	W. J. Dulany, Baltimore, Md.	Stationery.
2862	Sept. 1, 1900	Chas. G. Stott & Co., Washington, D. C.	Do.
2863	Sept. 4, 1900	R. C. Ballantyne, Washington, D. C.	Do.
2864	Sept. 10, 1900	E. Morrison Paper Co., Washington, D. C.	Do.
2868	Sept. 8, 1900	W. B. Moses & Sons, Washington, D. C.	Furniture.
2869	do	do	Do.
2876	Sept. 13, 1900	S. S. Daish & Sons, Washington, D. C.	Fuel.
2880	Oct. 23, 1900	do	Do.
2894	Feb. 19, 1901	A. P. Smith Manufacturing Co., Newark, N. J.	Curb and corporation cocks.
2937	Feb. 28, 1901	Lewis Hoppenmaier, Washington, D. C.	Plumbers' supplies.

## Statement of contracts for furnishing construction material for fiscal year 1901.

No.	Date.	Name and address of contractor.	To furnish.
2785	July 2, 1900	Washington Asphalt Block and Tile Co., Washington, D. C.	Asphalt paving blocks.
2786	July 6, 1900	John B. Lord, Washington, D. C.	Screened gravel.
2788	July 2, 1900	Francis Jones & Co., Lithonia, Ga.	Granite curb.
2802	July 17, 1900	Angus Lamond, Washington, D. C.	Terra-cotta material.
2804	July 5, 1900	Lewis E. Smoot, Alexandria, Va.	Paving and concrete sand.
2805	July 2, 1900	Eastern Paving Brick Co., Catskill, N. Y.	Vitrified paving blocks.
2807	July 20, 1900	National Mortar Co., Washington, D. C.	Cement.
2809	June 29, 1900	Lehigh Portland Cement Co., Allentown, Pa.	Do.
2818	July 21, 1900	American Clay Manufacturing Co., Pittsburg, Pa.	Paving blocks.
2819	do	do	Sewer invert bricks.
2820	July 25, 1900	Camden Iron Works, Philadelphia, Pa.	Cast-iron water pipe.
2825	do	Mack Manufacturing Co., Pittsburg, Pa.	Sewer invert block.
2836	July 11, 1900	J. H. McGill, Washington, D. C.	Natural cement.
2877	July 13, 1900	U. S. Cast Iron Pipe and Foundry Co., Philadelphia, Pa.	Cast-iron water pipe.
2886	Nov. 20, 1900	Venable Bros., Atlanta, Ga.	Granite curb.
2891	Jan. 19, 1900	Guise Brick and Stone Co., Williamsport, Pa.	Sewer invert brick.
2927	June 11, 1900	Washington Asphalt Block and Tile Co., Washington, D. C.	Asphalt blocks.
2932	June 21, 1900	Columbia National Sand and Dredging Co., Washington, D. C.	Paving and concrete sand.
2934	June 24, 1900	Lehigh Portland Cement Co., Allentown, Pa.	Portland cement.
2935	June 17, 1900	Standard Brick Co., Washington, D. C.	Sewer bricks.

Statement of construction, hauling, and miscellaneous contracts for fiscal year 1901.

Date.	Name and address of contractor.	Description.
July 21, 1900	Welsbach Street Lighting Co., of America, Philadelphia, Pa.	Furnish, operate, repair, and maintain Welsbach street lights.
July 12, 1900	Washington Gaslight Co., Washington, D. C.	Furnish gas, operate, and maintain Collins lamps.
July 18, 1900	Cranford Paving Co., Washington, D. C.	Improve grounds of Hubbard School on Kenyon street between Sherman avenue and Thirteenth.
July 26, 1900	H. I. Gregory, Washington, D. C.	Construct hot air hot blast heating apparatus for school building, South Carolina avenue and Second street SE.
do	do	Construct hot air hot blast heating apparatus for school building, Fifteenth street NE. between Gales and Rose-dale streets.
July 18, 1900	James M. Dunn, Washington, D. C.	Construct an 8-room school building, South Carolina avenue and Second street SE.
June 26, 1900	Georgetown Gaslight Co., Washington, D. C.	Furnish, operate, and maintain street lighting west of Rock Creek.
July 28, 1900	E. P. Allis Company, Milwaukee, Wis.	Design and furnish general and detail plans, furnish and erect complete 2 pumping engines.
Aug. 1, 1900	S. S. Shedd & Bro., Washington, D. C.	Repair and change plumbing in Force School building, Massachusetts avenue between Seventeenth and Eighteenth NW.
Aug. 6, 1900	John Hughes, jr., Washington, D. C.	Construct chemical engine house at Fortieth and Xenia streets.
July 11, 1900	Standard Lime and Stone Co., Baltimore, Md.	Quarry, crush, and deliver stone at quarry at Dickersons, Md.
Aug. 20, 1900	Arthur Cowsill, Washington, D. C.	Construct complete manual training school on square 553.
Aug. 13, 1900	Jas. Nolan & Sons, Washington, D. C.	Repair and change plumbing in Gales school intersection Massachusetts avenue, First, and G.
Aug. 14, 1900	H. I. Gregory, Washington, D. C.	Construct complete hot air, hot blast heating apparatus, Takoma Park School.
Aug. 7, 1900	W. H. Larman, Washington, D. C.	Furnish, deliver, and set up complete steam boilers in Franklin School.
Aug. 24, 1900	D. F. Mockabee, Washington, D. C.	Erect and complete porch on north wing of almshouse at Washington Asylum.
Aug. 13, 1900	H. E. Burgess, Washington, D. C.	Construct complete school building on Piney Branch road near Blair road, Takoma Park.
do	Jas. Nolan & Sons, Washington, D. C.	Repair and change plumbing in Garnet School building, U street NW., between Tenth and Vermont avenue.
Aug. 24, 1900	Pavarini & Greer, Washington, D. C.	Construct complete truck house on Whitney avenue, between Thirteenth and Fourteenth NW.
Aug. 28, 1900	Jas. M. Dunn, Washington, D. C.	Construct an 8-room school building, Fifteenth street NE., between Rose-dale and Gales.
Aug. 29, 1900	do	Construct complete an assembly hall at Reform School for Boys.
Sept. 27, 1900	Chas. T. Holloway & Co., Baltimore, Md.	Furnish and deliver 2 chemical engines and hose wagons.
do	do	Furnish and deliver 1 chemical engine.
Sept. 18, 1900	The Fire Extinguisher Manufacturing Co., New York City.	Furnish and deliver 1 water tower.
Sept. 27, 1900	Gheeson & Humphrey, Washington, D. C.	Construct complete 8-room school building on block 9, Barry Farm, Nichols avenue.
Oct. 8, 1900	Pavarini & Greer, Washington, D. C.	Construct corridor and inclose yard walls at Girls' Reform School.
Oct. 9, 1900	William E. Speir, Washington, D. C.	Construct manual training school at Seventh and Rhode Island avenue, NW.
Oct. 30, 1900	Geisel Construction Co., St. Louis, Mo.	Construct Melan arch bridge on line of Quarry road across Rock Creek.
Oct. 19, 1900	H. I. Gregory, Washington, D. C.	Construct hot air hot blast heating apparatus in school building, block 9, Barry Farm Subdivision, Nichols avenue.
Oct. 30, 1900	Geisel Construction Co., St. Louis, Mo.	Construct Melan arch bridge on line of Rock Creek drive, across Piney branch.
Nov. 1, 1900	H. F. Boswell & Co., Washington, D. C.	Furnish and place boiler in harbor boat Vigilant.
Nov. 8, 1900	Fredk. Drew, Washington, D. C.	Improve grounds of Johnson School building, Mount Pleasant.

*Statement of construction, hauling, and miscellaneous contracts, etc.—*

No.	Date.	Name and address of contractor.	Description.
2885	Nov. 10, 1900	Lyons Bros., Washington, D. C. ....	Construct rubble masonry east bank of Rock Creek. Woody Lane bridge.
2887	Oct. 11, 1900	Washington Fertilizer Co., Washington, D. C.	To collect and dispose of garbage.
2888	Dec. 19, 1900	Cranford Paving Co., Washington, D. C.	Complete foundation of bridge across Rock Creek. Connecticut avenue extension.
2890	Jan. 9, 1901	Pavarini & Greer, Washington, D. C.	Construct complete asphalt building northwest corner of D and E streets NE.
2892	Jan. 28, 1901	Meads & Reynolds, Washington, D. C.	Construct complete a pole Whitney avenue, between Brightwood and Wisconsin fire hydrants.
2895	Mar. 9, 1901	M. J. Drummond, New York City	Construct rear wing of Washington Asylum.
2896	Mar. 16, 1901	W. E. Speir, Washington, D. C. ....	Furnish and erect pump and sewerage pumping station.
2897	Mar. 19, 1901	Camden Iron Works, Philadelphia, Pa.	Construct receiving ward on Asylum.
2898	Mar. 20, 1901	H. E. Burgess, Washington, D. C. ....	Construct 8-room school lots 6 and 7, square 653.
2900	Apr. 8, 1901	D. F. Mockabee, Washington, D. C. ..	Furnish hand street-sweeping machines.
2901	Apr. 5, 1901	Sanitary Street Sweeping Co., Washington, D. C.	Construct 8-room school Third and K streets SW.
2903	Apr. 11, 1901	Jas. M. Dunn, Washington, D. C. ....	Improving the grounds of house on Whitney avenue, tenth street.
2904	Apr. 16, 1901	Cranford Paving Co., Washington, D. C.	Furnish engine, wheel and harbor boat Vigilant.
2905	Apr. 13, 1901	W. S. Moore's Sons, Alexandria, Va.	Construct 8-room school on Florida avenue, between street and Florida avenue.
2907	Apr. 22, 1901	Pavarini & Greer, Washington, D. C.	Construct all drainage, pipe fitting in grounds of trial Home School.
2912	May 4, 1901	E. J. Hannan, Washington, D. C. ....	Construct all cell work in workhouse on reservation.
2913	Apr. 11, 1901	Pauly Jail Building and Manufacturing Co., St. Louis, Mo.	Construct, complete 4-story building, Industrial Home, Tennallytown road.
2914	May 6, 1901	Pavarini & Greer, Washington, D. C.	Construct all drainage, pipe fitting in grounds of trial Home School.
2917	May 21, 1901	E. J. Hannan, Washington, D. C. ....	Construct all drainage, pipe fitting in grounds of trial Home School.
2919	May 24, 1901	Burgess & Parsons, Washington, D. C.	Construct chemical fire-engine for chemical fire-engine, Thirteenth street, between Thirteenth and Brookland.
2920	May 21, 1901	E. J. Hannan, Washington, D. C. ....	Construct chemical fire-engine lot 18, block 22, Brookland street between Twelfth and Thirteenth.
2922	May 24, 1901	Antonio Malnati, Washington, D. C.	Repair and change plumbing of Washington Asylum.
2923	June 7, 1901	C. A. Schneider's Sons, Washington, D. C.	Construct a stone wall on west sides of Dent School,olina avenue and Second.
2924	June 4, 1901	American Development Co., Chicago, Ill.	Furnish and erect iron fencing of the Brightwood reservation.
2925	June 10, 1901	Welsbach Street Lighting, Philadelphia, Pa.	Furnish, operate, and maintain lamps.
2928	June 19, 1901	W. W. Biggs Heating and Ventilating Co., Washington, D. C.	Furnish and erect horizontal steam boilers for Central, and Lincoln schools.
2929	June 20, 1901	Littlefield, Alvord & Co., Washington, D. C.	Haul sand, gravel, broken stone.
2930	June 17, 1901	William A. Kimmel, Washington, D. C.	Construct 2 gate houses at reservoir.
2931	June 22, 1901	Ellicott Machine Co., Baltimore, Md.	Furnish and erect horizontal steam boilers for Force and schools.
2933	.....do.....	Springmann's Express Co., Washington, D. C.	Haul cast-iron water pipe.
2936	June 24, 1901	S. S. Shedd & Bro., Washington, D. C.	Repair and change plumbing Patterson, Phelps, and schools.
2938	June 26, 1901	Cranford Paving Co. ....	Construct concrete arch bridge Broad Branch on line of

# OPERATIONS OF THE ENGINEER DEPARTMENT, D. C. 173

*Schedule of proposals for construction of sewers, opened September 8, 1900.*

## SEWER A.

[Fifteenth street NW. between Q and Corcoran and New Hampshire avenue between Corcoran and Riggs.]

Bidder.	Ordinary excavation.	Brick masonry, natural-cement mortar.	24-inch pipe.	21-inch pipe.	18-inch pipe.	Total.
Vinson .....	\$0.57	\$10.75	\$0.76	\$0.64	\$0.53	\$1,634.50
s Bros .....	.70	13.00	.85	.79	.73	1,962.80

## SEWER B.

[8 street NW. between Fourteenth and Fifteenth.]

Bidder.	Ordinary excavation.	Brick masonry, natural-cement mortar	24-inch pipe.	21-inch pipe.	18-inch pipe.	Total.
Vinson .....	\$0.54	\$10.75	\$0.74	\$0.63	\$0.52	\$1,472.62
s Bros .....	1.10	13.75	1.10	1.00	.95	2,619.80

## SEWER C.

[Fourteenth street NW. between E and S.]

Bidder.	Ordinary excavation.	Brick masonry, natural-cement mortar.	15-inch pipe.	12-inch pipe.	Total.
Vinson .....	\$0.54	\$10.75	\$0.49	\$0.42	\$1,145.75
s Bros .....	1.10	13.75	.80	.75	2,107.50

## SEWER D.

[L street NW. between Sixteenth and Twentieth.]

Bidder.	Ordinary excavation.	Brick masonry, natural-cement mortar.	Vitrified-brick masonry, part-cement mortar.	Concrete masonry, natural-cement mortar.	Concrete masonry, part-cement mortar.	Total.
Vinson .....	\$0.54	\$9.60	\$17.00	\$5.27	\$6.77	\$30,285.32
s Bros .....	.80	12.50	22.50	7.50	9.50	28,662.70
Coyle .....	.57	10.40	20.00	7.40	8.90	24,182.43
1 Jacoby .....	.70	10.00	20.00	5.50	7.75	24,025.55

*Proposals for construction of sewers, opened November 24, 1900.*

Bidder.	Ordinary excavation.	Em-bankment.	Red-brick masonry, natural-cement mortar.	Red-brick masonry, Portland-cement mortar.	Vitrified-brick masonry, Portland-cement mortar.	Concrete masonry, natural cement.	Concrete masonry, Portland cement	Total.
ns Bros .....	\$0.30	\$0.20	\$8.96	\$10.97	\$15.92	\$4.65	\$7.00	\$167,724.35
n Jacoby .....	.30	.18	8.50	10.00	18.00	4.20	6.00	159,716.00
Sweeten & Son .....	.61	.15	9.50	12.09	17.20	5.57	8.24	196,046.35
Coyle & Co. ....	.38	.30	9.50	12.00	18.00	5.90	8.00	182,577.00
son & Michael .....	.30	.18	8.00	11.47	17.40	4.83	6.41	161,785.85
rew Gleeson .....	.35½	.12½	8.60	11.96	17.46	5.00	7.03	170,584.00

## 174 OPERATIONS OF THE ENGINEER DEPARTMENT, D. C.

Schedule of proposals for constructing gates, connections, and outlet section of the Tiber Creek and New Jersey avenue high level intercepting sewer, opened January 26, 1901.

Bidder.	Outlet section and tide gates.										
	Ordinary excavation.	Red-brick masonry, natural-cement mortar.	Vitrified-brick masonry, Portland-cement mortar.	Concrete masonry, natural-cement mortar.	Concrete masonry "A," Portland-cement mortar.	Concrete masonry "B," Portland-cement mortar.	Piling.	Lumber.	Steel I beams.	Cast-iron bed plates.	Tide gates.
Andrew Gleeson.	\$0.98	\$9.80	\$18.80	\$4.85	\$8.70	\$6.90	\$0.38	\$39.00	\$0.05	\$0.04	\$249.50
John Jacoby . . .	1.00	10.00	20.00	6.00	12.00	8.00	.30	30.00	.03	.02	125.00
											\$58.75
											75.00
											\$1.00
											\$1.25
											\$1.50
											\$1.75
											\$2.00
											\$2.25
											\$2.50
											\$2.75
											\$3.00
											\$3.25
											\$3.50
											\$3.75
											\$4.00
											\$4.25
											\$4.50
											\$4.75
											\$5.00
											\$5.25
											\$5.50
											\$5.75
											\$6.00
											\$6.25
											\$6.50
											\$6.75
											\$7.00
											\$7.25
											\$7.50
											\$7.75
											\$8.00
											\$8.25
											\$8.50
											\$8.75
											\$9.00
											\$9.25
											\$9.50
											\$9.75
											\$10.00
											\$10.25
											\$10.50
											\$10.75
											\$11.00
											\$11.25
											\$11.50
											\$11.75
											\$12.00
											\$12.25
											\$12.50
											\$12.75
											\$13.00
											\$13.25
											\$13.50
											\$13.75
											\$14.00
											\$14.25
											\$14.50
											\$14.75
											\$15.00
											\$15.25
											\$15.50
											\$15.75
											\$16.00
											\$16.25
											\$16.50
											\$16.75
											\$17.00
											\$17.25
											\$17.50
											\$17.75
											\$18.00
											\$18.25
											\$18.50
											\$18.75
											\$19.00
											\$19.25
											\$19.50
											\$19.75
											\$20.00
											\$20.25
											\$20.50
											\$20.75
											\$21.00
											\$21.25
											\$21.50
											\$21.75
											\$22.00
											\$22.25
											\$22.50
											\$22.75
											\$23.00
											\$23.25
											\$23.50
											\$23.75
											\$24.00
											\$24.25
											\$24.50
											\$24.75
											\$25.00
											\$25.25
											\$25.50
											\$25.75
											\$26.00
											\$26.25
											\$26.50
											\$26.75
											\$27.00
											\$27.25
											\$27.50
											\$27.75
											\$28.00
											\$28.25
											\$28.50
											\$28.75
											\$29.00
											\$29.25
											\$29.50
											\$29.75
											\$30.00
											\$30.25
											\$30.50
											\$30.75
											\$31.00
											\$31.25
											\$31.50
											\$31.75
											\$32.00
											\$32.25
											\$32.50
											\$32.75
											\$33.00
											\$33.25
											\$33.50
											\$33.75
											\$34.00
											\$34.25
											\$34.50
											\$34.75
											\$35.00
											\$35.25
											\$35.50
											\$35.75
											\$36.00
											\$36.25
											\$36.50
											\$36.75
											\$37.00
											\$37.25
											\$37.50
											\$37.75
											\$38.00
											\$38.25
											\$38.50
											\$38.75
											\$39.00
											\$39.25
											\$39.50
											\$39.75
											\$40.00
											\$40.25
											\$40.50
											\$40.75
											\$41.00
											\$41.25
											\$41.50
											\$41.75
											\$42.00
											\$42.25
											\$42.50
											\$42.75
											\$43.00
											\$43.25
											\$43.50
											\$43.75
											\$44.00
											\$44.25
											\$44.50
											\$44.75
											\$45.00
											\$45.25
											\$45.50
											\$45.75
											\$46.00
											\$46.25
											\$46.50
											\$46.75
											\$47.00
											\$47.25
											\$47.50
											\$47.75
											\$48.00
											\$48.25
											\$48.50
											\$48.75
											\$49.00
											\$49.25

# OPERATIONS OF THE ENGINEER DEPARTMENT, D. C. 175

## Schedule of proposals for construction of sewers, etc.—Continued.

### SEWER C.

Bidder.	Ordinary excavation.	Brick masonry.	24-inch pipe.	15-inch pipe.	Total cost.
n Jacoby.....	\$0.35	\$10.50	\$1.00	\$0.85	\$3,818.50
P. Talty.....	.69	14.00	.65	.45	4,479.50
F. Talbert.....	.80	10.25	.70	.55	4,914.75
P. McNamara & Co.....	.80	12.00	1.16	.75	5,894.40
ons Bros.....	1.00	12.00	.99	.85	6,381.10

### SEWER D.

Bidder.	Ordinary excavation.	Brick masonry.	Vitrified-brick masonry.	Concrete masonry, natural-cement mortar.	Concrete masonry, Portland-cement mortar.	Inverted blocks.	Total cost.
n P. Larguey.....	\$0.55	\$10.25	\$17.00	\$5.25	\$7.35	\$0.70	\$2,091.55
P. Talty.....	.69	14.00	22.00	5.00	6.00	.80	2,351.50
F. Talbert.....	.62	10.50	17.25	5.00	7.50	.70	2,169.50
ons Bros.....	.50	11.50	19.00	6.50	8.00	.74	2,221.50

## Schedule of proposals received for sewer construction, opened June 18, 1901.

### SEWER A.

[Fourteenth street NW., between N and Rhode Island avenue.]

Bidder.	Excavation.	Brick masonry.	15-inch pipe.	12-inch pipe.	10-inch pipe.	Total cost.
ons Bros.....	\$0.65	\$10.50	\$0.75	\$0.71	\$0.68	\$1,704.50
rrren F. Brenizer.....	.68	12.00	.74	.66	.66	1,745.60
b. Vinson.....	.80	11.25	.70	.65	.60	1,840.00
t. Gummel.....	1.00	12.50	.77	.65	.56	2,114.80

### SEWER B.

[M street NW., between Seventh and Eighth, and in alley, square 424.]

Bidder.	Excavation.	Brick masonry.	21-inch pipe.	18-inch pipe.	15-inch pipe.	12-inch pipe.	Total cost.
ons Bros.....	\$0.65	\$10.75	\$0.93	\$0.85	\$0.75	\$0.71	\$1,716.05
rrren F. Brenizer.....	.65	12.00	.91	.80	.71	.625	1,682.92
b. Vinson.....	1.20	11.25	.85	.75	.75	.65	2,382.75
t. Gummel.....	1.00	12.50	1.00	.89	.77	.65	2,203.25

### SEWER C.

[Thirteenth street SW., between B and D.]

Bidder.	Excavation.	Brick masonry.	21-inch pipe.	18-inch pipe.	12-inch pipe.	Total cost.
ons Bros.....	\$0.65	\$10.75	\$0.93	\$0.85	\$0.71	\$1,094.75
rrren F. Brenizer.....	.65	12.00	.99	.89	.73	1,744.55
b. Vinson.....	.95	11.50	.85	.75	.65	2,007.75
t. Gummel.....	1.00	12.50	1.00	.89	.65	2,175.30

### SEWER D.

[Twenty-second street NW., between Virginia avenue and G.]

Bidder.	Excavation.	Brick masonry.	18-inch pipe.	12-inch pipe.	Total cost.
ons Bros.....	\$0.65	\$10.75	\$0.85	\$0.71	\$942.85
rrren F. Brenizer.....	.61	12.00	.78	.61	876.90
b. Vinson.....	.75	11.25	.70	.65	956.75
t. Gummel.....	1.00	12.50	.89	.65	1,203.80

*Schedule of proposals received for sewer construction, etc.—Continued.*

## SEWER E.

[Twelfth street SW., between D and Virginia avenue.]

Bidder.	Excava- tion.	Brick masonry.	18-inch pipe.	15-inch pipe.	12-inch pipe.	Total cost.
Lyons Bros .....	\$0.635	\$12.00	\$0.78	\$0.69	\$0.625	\$2,162.38
Warren F. Brenizer .....	.70	11.25	.75	.70	.60	2,134.30
P. D. Vinson .....	.65	10.75	.85	.75	.71	2,157.70
E. G. Gummel .....	1.00	12.50	.89	.77	.65	2,738.30

## SEWER F.

[North Capitol street sewer, between G and K streets.]

Bidder.	Excava- tion.	Brick masonry, natural cement.	Vitrified brick masonry, Portland cement.	Concrete masonry, natural cement.	Concrete masonry, Portland cement.	Total cost.
Lyons Bros .....	\$3.00	\$13.25	\$42.00	\$10.00	\$12.00	\$8,300.00
Warren F. Brenizer .....	1.85	19.00	30.00	7.10	13.00	6,704.50

*Schedule of proposals received June 22, 1901, for the construction of sewers.*

## SEWER A.

[Sewer from Third and Cincinnati streets NE. through grounds of W. W. Davidge and Trinity College to Michigan avenue.]

Bidder.	Ordinary excava- tion.	Brick ma- sonry, natural- cement mortar.	Vitrified brick masonry, Portland- cement mortar.	Concrete masonry, natural- cement mortar.	Concrete masonry, Portland- cement mortar.	Total
E. G. Gummel .....	\$0.50	\$10.05	\$17.50	\$5.20	\$6.25	\$30,385.00
John Jacoby .....	.36	10.50	19.00	5.00	6.50	19,367.00
American Artificial Stone Pavement and Construc- tion Co. ....	.75	12.54	19.91	6.11	7.76	25,730.70
John F. Talbert .....	.37	11.50	18.00	5.12	7.50	20,425.00
Lyons Bros .....	.60	12.00	20.00	5.50	7.00	22,982.00
Larguey & Cavan .....	.45	11.50	17.25	5.50	7.40	21,290.75
W. F. Brenizer .....	.55	11.25	19.00	5.10	6.60	21,608.25
R. A. Malone & Co .....	.50	9.00	14.00	4.75	6.70	19,608.25

## SEWER B.

[Hartford street NE., between Seventh and Ninth streets, and in Seventh street NE., between Galena and Hartford.]

Bidder.	Ordinary excava- tion.	Brick ma- sonry, natural- cement mortar.	Vitrified brick ma- sonry, Portland- cement mortar.	Con- crete ma- sonry, natural- cement mortar.	Con- crete ma- sonry, Portland- cement mortar.	Vitrified brick in- verts, Portland- cement mortar.	24-inch pipe sewer.	21-inch pipe sewer.	Total
E. G. Gummel .....	\$1.00	\$12.50	\$19.75	\$5.50	\$6.75	\$0.85	\$1.25	\$1.10	\$4,511.00
W. F. Brenizer .....	1.25	12.00	22.00	5.25	6.60	.80	1.60	1.45	5,222.25
R. A. Malone & Co .....	.60	9.00	15.00	5.00	7.00	1.25	2.00	2.00	4,250.50

*Schedule of proposals received, etc., for the construction of sewers—Continued.*

SEWER C.

[Arizona avenue, north from New Cut road.]

Bidder.	Ordinary excavation.	Rock excavation.	Em-bankment.	Brick masonry, natural-cement mortar.	Vitri-fied brick masonry, Portland-cement mortar.	Concrete masonry, natural-cement mortar.	Concrete masonry, Portland-cement mortar.	6-inch pipe drain.	Total.
E. G. Gummel.....	\$0.65	\$3.00	\$0.40	\$12.75	\$21.00	\$5.00	\$6.50	\$0.20	\$27,388.75
John Jacoby.....	.60	4.00	.20	12.50	19.00	5.50	7.60	.15	27,338.50
American Artificial Stone Pavement and Construction Co.....	.51	3.00	.75	12.54	19.91	6.11	7.76	.05	28,450.95
Lyons Bros.....	.55	4.00	.25	11.80	16.00	5.00	7.00	.15	25,848.80
W. F. Brenizer.....	.59	4.00	.25	11.20	16.60	4.80	7.20	.15	26,229.80
R. A. Malone & Co.....	.45	3.00	.25	8.75	14.00	4.75	6.75	.25	23,294.00

SEWER D.

[Arizona avenue, beginning at a point 3,300 feet north of New Cut road.]

Bidder.	Ordinary excavation.	Rock excavation.	Em-bankment.	Brick masonry, natural-cement mortar.	Vitri-fied brick masonry, Portland-cement mortar.	Concrete masonry, natural-cement mortar.	Concrete masonry, Portland-cement mortar.	6-inch pipe drain.	Total.
E. G. Gummel.....	\$0.60	\$3.00	\$0.40	\$12.75	\$21.00	\$5.00	\$6.50	\$0.20	\$30,466.25
John Jacoby.....	.55	4.00	.20	11.50	19.50	5.50	7.50	.15	31,270.00
American Artificial Stone Pavement and Construction Co.....	.51	3.00	.75	12.54	19.91	6.11	7.76	.05	32,499.15
Lyons Bros.....	.59	4.00	.25	12.00	16.00	5.00	7.00	.15	29,532.50
W. F. Brenizer.....	.51	4.25	.20	11.20	16.60	5.00	6.95	.15	28,676.00
R. A. Malone & Co.....	.40	3.00	.25	9.00	13.75	4.70	6.70	.25	25,976.75

*Schedule of proposals for constructing Melan arch bridge across Rock Creek, on line of Rock Creek drive, opened October 13, 1900.*

Bidder.	Amount.	Bidder.	Amount.
Geisel Construction Co.....	\$2,600	O'Hearn & Berrigan.....	\$3,674
American Bridge Co.....	4,400	Cranford Paving Co.....	5,200
Brennan Construction Co.....	3,900	Chas. A. Hook & Son.....	3,900
Amos F. Shover.....	2,850		

*Schedule of proposals for constructing Melan arch bridge across Rock Creek, on line of Quarry road.*

Bidder.	Amount.	Cost of additional width per foot.	Decrease in cost for foot of width.
Geisel Construction Co.....	\$16,850	\$300	\$290
American Bridge Co.....	17,400	354	362
Brennan Construction Co.....	18,000	500	500
Amos F. Shover.....	18,400	350	300
O'Hearn & Berrigan.....	18,644	421	421
Cranford Paving Co.....	18,700	500	400
Chas. A. Hook & Sons.....	19,560	1,000	225

# 178 OPERATIONS OF THE ENGINEER DEPARTMENT, D. C.

*Schedule of proposals for construction of concrete arch bridge across Branch on line of the Argyle road, opened June 15, 1901.*

Bidder.	Amount.	Bidder.
Cranford Paving Co .....	\$3,955	Arthur Cowseill.....
M. F. Talty .....	3,960	W. B. Upton Co.....
Lyons Bros.....	4,870	Brennan Construction Co .....
Carmody & Hough.....	6,000	

<sup>1</sup> With gravel.

<sup>2</sup> With stone.

*Proposals for constructing foundations for masonry bridge across Rock line of Connecticut avenue extended, opened December 1, 1900.*

Bidder.	Earth excavation (cubic yard).	Rock excavation (cubic yard).	Concrete foundation masonry (cubic yard).
James C. McGuire .....	\$0.49 <sup>1</sup>	\$2.50	\$5.59
Cranford Paving Co.....	.64	3.40	5.20
Brennan Construction Co.....	.86	3.00	5.31
Geisel Construction Co.....	.70	3.90	5.40
Andrew Gleeson.....	.58 <sup>1</sup>	1.95	5.98
Lyons & Co.....	.65	3.50	6.50

*Schedule of proposals for grading and regulating streets and avenues, July 7, 1900.*

Bidder.	Grading (square yard).	6 by 20 inch curb (linear foot).	8 by 8 inch curb (linear foot).	Cobble gutters (square yard).
Washington Asphalt Block and Tile Co.....	\$0.32	\$0.18	\$0.33	\$0.16
Andrew Gleeson .....	.32	.18	.29	.38
M. F. Talty.....	.34	.20	.38	.25
Lyons Bros.....	.35	.20	.34	.27

*Schedule of proposals for grading certain streets and avenues, opened July*

Bidder.	Cathedral avenue.	Frankfort street, Langdon.	Crescent street.
M. F. Talty .....	cubic yard.. \$0.30	\$0.32	\$0.35
G. B. Mullin.....	do.....		.32
Lyons Bros.....	do.....	.30	.28
P. D. Vinson.....	do.....	.41	
Andrew Gleeson.....	do.....	.34 <sup>1</sup>	.33 <sup>1</sup>
Matthew Myers.....	do.....	.32	
Patrick Keilty & Bro.....	do.....	{ 1.32 1.45	

<sup>1</sup> Short haul.

<sup>2</sup> Long haul.

OPERATIONS OF THE ENGINEER DEPARTMENT, D. C. 179

*Schedule of proposals for grading Cathedral avenue, opened July 21, 1900.*

Bidder.	In limits of ave- nue.	Borrow.		
		A.	B.	C.
Brenizer.....cubic yard..	\$0.24	\$0.24	\$0.39	\$0.35
W Gleeson.....do.....	.26	.27	.38	.37½
S M. Bond.....do.....	.24½	.24½	.41	.43

*Proposals for grading Adams Mill road, opened March 30, 1901.*

Bidder.	Price per cubic yard.	Bidder.	Price. per cubic yard.
W Gleeson.....	\$0.22	Pitts & Hawkins.....	\$0.29
dy & Hough.....	.225	John Jacoby.....	.33
Talty.....	.23	Lyons Bros.....	.36

*ule of proposals for grading Columbia road east of Thirteenth street NW.,  
opened April 13, 1901.*

Bidder.	Price per cubic yard.	Bidder.	Price per cubic yard.
egan & Co.....	\$0.23	Lyons Bros.....	\$0.30
dy & Hough.....	.26	M. F. Talty.....	.31
W Gleeson.....	.30		

*Schedule of proposals for grading Connecticut avenue west of Rock Creek.*

Bidder.	Price per cubic yard.	Bidder.	Price per cubic yard.
egan & Co.....	\$0.42	John Jacoby.....	\$0.50
dy & Hough.....	.43	M. F. McNamara & Co.....	.53
s Bros.....	.43	Pitts & Hawkins.....	.57
Mullin.....	.47		

*Rule of proposals received May 4, 1901, for grading certain streets and avenues.*

Bidder.	Joliet street.	Blagden avenue.	Illinois avenue.	Ne- braska avenue.
Hawkins & Trundle.....cubic yard..	\$0.285	\$0.63	\$0.27	\$0.27
Talty.....do.....	.38	.45	.25	.30
Mullin.....do.....		.38		
in & Ball.....do.....	.445	.32	.345	
Jacoby.....do.....	.23	.55	.28	.32
ew Gleeson.....do.....	.39	.40	.235	.245
son & Smith.....do.....			.25	
Birmingham.....do.....	.25		.25	
Malone.....do.....	.30			
ew Myers.....do.....			.24	
Burrows Constructing Co.....do.....				.294
H. Allen.....do.....	.45	.40	.22	.35
s Bros.....do.....	.35	.4975	.26	.35

180 OPERATIONS OF THE ENGINEER DEPARTMENT, D.

*Schedule of proposals for paving streets and avenues with sheet asphalt  
June 1, 1901.*

ASPHALT SURFACE.

Bidder.	Gutters.		Pavement A.	
	Vitrified brick.	Cement.	Price.	Total, includi
				Vitrified brick.
Barber Asphalt Paving Co.....	A \$1.42 B 1.50 C 1.09	\$2.65	\$1.795	\$124,070.00
Brennan Construction Co.....	A 1.37 B 1.38 C 1.40			
Cranford Paving Co.....	A 1.27 B 1.35 C 1.40			
Warner Quinlan Asphalt Co.....	A 1.09 B 1.09 C 1.09	1.72	1.72	116,450.00

Bidder.	Pavement B.			Pavement C.	
	Price.	Total, including gutters.		Price.	Total, h
		Vitrified brick.	Cement.		Vitrified brick.
Barber Asphalt Paving Co.....	\$1.90	\$131,300.00	\$141,650.00	\$1.98	\$137,970.00
Brennan Construction Co.....	1.76	121,540.00	133,420.00	1.78	122,960.00
Cranford Paving Co.....	1.84	126,230.00	135,680.00	1.92	131,640.00
Warner Quinlan Asphalt Co.....	1.72	116,450.00	122,120.00	1.72	116,450.00

*Schedule of proposals for paving Bladensburg road with asphalt and  
blocks, opened April 20, 1901.*

Bidder.
Barber Asphalt Paving Co.....
Cranford Paving Co.....

*Schedule of proposals for laying cement sidewalks, opened October*

Bidder.	Class A.	Class B.
Colburn Paving Co.....square yard..	\$1.05+	\$1.10
Cranford Paving Co.....do.....	1.08	1.10
Brennan Construction Co.....do.....	1.09	1.10
F. M. Kemp & Sons.....do.....	1.11	1.10

*Schedule of proposals for laying certain cement sidewalks, opened October*

Bidder.	Price.
Fred Drew.....	\$1.00
Cranford Paving Co.....	1.00
Colburn Paving Co.....	1.00
Brennan Construction Co.....	1.00

*Schedule of proposals for constructing an eight-room school building on Fifteenth street NE., between Rosedale and Gales streets, opened June 30, 1900.*

Bidder.	Complete, galvanized-iron cornice.	Complete, copper cornice.	Cement mortar through-out, extra.	Floor with steel girders in school rooms, extra.
D. F. Mockabee.....	\$27,168	\$28,078	\$345	\$653
J. M. Dunn.....	30,886	31,540	600	295
Gleeson & Humphrey.....	32,000	32,500	600	600
Pavarini & Greer.....	34,900	35,300	450	900
John Hughes, jr.....	35,465	35,690	300	592

*Schedule of proposals for constructing an eight-room school building, northeast corner South Carolina avenue and Second street SE., opened June 30, 1900.*

Bidder.	Amount.	Bidder.	Amount.
J. M. Dunn.....	\$31,380	Pavarini & Greer.....	\$34,070
Geo. W. Corbett.....	32,475	Gleeson & Humphrey.....	34,500
D. F. Mockabee.....	33,909	J. Hughes, jr.....	35,813

*Schedule of proposals for improving the grounds of the Hubbard School, opened July 7, 1900.*

Bidder.	Sodding.		Cement pavement.		Total.
	Price.	Amount.	Price.	Amount.	
	<i>Sq. yd.</i>		<i>Sq. yd.</i>		
The Cranford Paving Co.....	\$0.25	\$75.00	\$1.25	\$1,500.00	\$1,575.00
H. T. Burrows.....	.25	75.00	1.25	1,500.00	1,575.00
Fred Drew.....	.35	105.00	1.31	1,572.00	1,677.00
Colburn Paving Co.....	.40	120.00	1.38½	1,662.00	1,782.00
Lyons Bros.....	.25	75.00	1.44	1,728.00	1,803.00
John H. Ellis.....		110.00	(1)	(1)	(1)

<sup>1</sup> Informal; no deposit.

*Schedule of proposals for constructing a four-room school building at Takoma Park, opened July 21, 1900.*

Bidder.	Amount.	Bidder.	Amount.
John C. Louthan.....	\$21,084.80	Gleeson & Humphrey.....	\$21,000.00
Pavarini & Greer.....	18,400.00	H. E. Burgess.....	17,136.00

*Schedule of proposals for constructing a chemical-engine house for fire department, corner Fortieth and Xenia streets NW., opened July 21, 1900.*

Bidder.	Amount.
Pavarini & Greer.....	\$16,400
John Hughes, jr.....	16,195

*Proposals for constructing a hot-air, hot-blast heating apparatus with mechanical ventilating appliances combined, for a four-room school building, Takoma Park.*

Bidder.	Amount.
H. I. Gregory.....	\$2,200
H. I. Gregory (gravity system).....	1,550

# 182 OPERATIONS OF THE ENGINEER DEPARTMENT, D. C.

*Schedule of proposals for constructing a manual training school building on south side of P street NW., between First and Third streets, opened July 23, 1900.*

Bidder.	Amount.	Bidder.	Amount.
Arthur Cowdell .....	\$114,480	Pavarini & Greer .....	\$118.88
Richardson & Burgess .....	117,280	E. Landvoigt .....	118.88
Saml. Prescott & Co. ....	117,888	W. Kimmel .....	122.88
Gleeson & Humphrey .....	118,600	D. F. Mockabee .....	122.88
Meads & Reynolds .....	118,794	John Hughes, Jr. ....	125.88

*Schedule of proposals for constructing an eight-room school building on lot 1, block 9, Barry Farm, Nichols avenue, Anacostia, opened September 1, 1900.*

Bidder.	Amount.	
	Proposal 1.	Proposal 2
Gleeson & Humphrey .....	\$24,800	\$25.88
Pavarini & Greer .....	25,400	26.88

*Schedule of proposals for constructing a manual training school at southeast corner Rhode Island avenue and Seventh street NW., opened September 22, 1900.*

Bidder.	Amount.	Bidder.	Amount.
W. E. Speir .....	\$105,680	Richardson & Burgess .....	\$112.87
W. A. Kimmel .....	107,000	Meads & Reynolds .....	118.78
Gleeson & Humphrey .....	108,900	Noble H. Thomas .....	122.88
W. C. Morrison .....	113,894	Henry F. Gets .....	124.88

*Schedule of proposals for constructing brick corridor, etc., at Girls' Reform School, opened September 26, 1900.*

Bidder.	Amount.
Pavarini & Greer .....	\$6,900
D. F. Mockabee .....	8,100

*Proposals for constructing police station on block 10, south side of Whitney avenue, between Sherman and Brightwood avenues NW.*

Bidder.	For building complete.	For plumbing work.	For cell work.
Meads & Reynolds .....	\$24,600		
John Hughes, Jr. ....	24,825		
Pavarini & Greer .....	25,500		
W. E. Speir .....	27,480		
D. F. Mockabee .....	27,951		
E. J. Hannan .....		\$2,229	
Jas. Nolan & Sons .....		2,445	
Champion Iron Co .....			\$1,050
Van Dorn Iron Co .....			1,377

**OPERATIONS OF THE ENGINEER DEPARTMENT, D. C. 183**

*Schedule of proposals for constructing an eight-room school building on northwest corner Twelfth and D streets NE.*

Bidder.	Amount.	Bidder.	Amount.
Pavarini & Greer .....	\$24,400	John Hughes, jr. ....	\$24,700
Gleeson & Humphrey .....	25,000	D. F. Mockabee .....	27,300
John C. Louthan .....	25,941		

*Schedule of proposals for constructing a rear wing for a new workhouse, opened January 3, 1901.*

Bidder.	Com- plete.	Cell con- struction omitted (deduct).	Cell wing, plumb- ing om- itted (de- duct).	Rear wing, cell work com- plete.	Utility system of cell construc- tion (add).	Locking device.
Gleeson & Humphrey .....	\$103,000	\$33,940	\$10,000	\$33,900	.....	.....
W. E. Speir .....	117,500	48,966	12,000	.....	.....	\$6,050
Van Dorn Iron Works .....	118,372	.....	22,129	101,243	\$2,045	135
Stewart Iron Works .....	.....	.....	12,000	66,000	.....	.....
Pauly Jail Building and Manufactur- ing Co. ....	.....	.....	12,000	38,277	44,208	6,050

<sup>1</sup> Per cell.

*Schedule of proposals for constructing a receiving ward, Washington Asylum, opened February 23, 1901.*

Bidder.	Amount.	Bidder.	Amount.
H. E. Burgess .....	\$12,487	Meads & Reynolds .....	\$13,800
Pavarini & Greer .....	12,780	John Hughes, jr. ....	14,585
D. F. Mockabee .....	13,184	Gleeson & Humphrey .....	17,000

*Schedule of proposals for constructing eight-room school building on Half street between N and O streets SW.*

Bidder.	Building complete (steam).	Building complete (hot air).	Plumbing only.
D. F. Mockabee .....	\$38,743	\$36,483	.....
Plumbing omitted .....	35,703	33,533	.....
J. M. Dunn .....	39,200	36,895	.....
Plumbing omitted .....	36,000	33,695	.....
Gleeson & Humphrey .....	39,800	37,900	\$3,000
Plumbing omitted .....	36,800	34,900	.....
Geo. W. Corbett .....	42,378	40,100	.....
Plumbing omitted .....	39,378	37,100	.....
W. E. Speir .....	43,000	42,000	.....
Plumbing omitted .....	40,050	39,050	.....
Pavarini & Greer .....	43,900	41,900	.....
Plumbing omitted .....	40,700	38,700	.....
N. H. Thomas .....	46,346	.....	.....
Plumbing omitted .....	43,346	.....	.....
E. J. Hannan .....	.....	.....	2,950
M. B. Casey .....	.....	.....	3,080
Jas. Nolan & Sons .....	.....	.....	3,234

## Schedule of proposals for constructing eight-room school building on Third and K streets SW., opened March 30, 1901.

Bidder.	Steam heat.		Hot air.			
	Complete.	Plumbing omitted.	Complete gas propulsion.	Plumbing omitted.	Complete electric propulsion.	Plumbing omitted.
J. M. Dunn.....	\$35,719.00	\$32,719.00	\$32,819.00	\$30,819.00	\$33,019.00	\$30,019.00
G. W. Corbett.....	36,605.00	33,507.00	34,800.00	31,500.00	35,000.00	31,700.00
Pavarini & Greer.....	36,700.00	33,500.00	34,700.00	31,500.00	34,900.00	31,700.00
Gleeson & Humphrey.....	37,800.00	34,700.00	35,800.00	32,700.00	36,000.00	33,000.00
Meads & Reynolds.....	37,989.00	34,871.00	35,844.00	32,746.00	36,044.00	33,046.00
D. F. Mockabee.....	37,997.00	34,899.00	36,282.00	33,184.00	36,482.00	33,384.00
N. H. Thomas.....	38,600.00	35,200.00	36,600.00	33,200.00	36,800.00	33,400.00
W. E. Speir.....	39,500.00	36,400.00	37,300.00	34,200.00	37,500.00	34,400.00
John Hughes, jr.....	41,900.00	38,491.65	39,900.00	36,491.65	40,100.00	36,691.65

Bidder.	Red brick.					
	Steam heat, complete.	Plumbing omitted.	Complete hot air, gas propulsion.	Plumbing omitted.	Complete electric propulsion.	Plumbing omitted.
J. M. Dunn.....	\$34,919.00	\$31,919.00	\$32,019.00	\$29,019.00	\$32,219.00	\$29,219.00
G. W. Corbett.....	35,405.00	32,400.00	33,600.00	31,500.00	33,800.00	31,700.00
Pavarini & Greer.....	35,600.00	32,400.00	33,700.00	31,500.00	33,900.00	31,700.00
Gleeson & Humphrey.....	36,800.00	33,700.00	34,700.00	31,600.00	34,900.00	31,900.00
Meads & Reynolds.....	36,984.00	33,886.00	34,859.00	31,761.00	35,059.00	31,961.00
D. F. Mockabee.....	36,735.00	33,637.00	35,049.00	31,951.00	35,249.00	32,151.00
N. H. Thomas.....	37,400.00	34,000.00	35,400.00	32,000.00	35,600.00	32,200.00
W. E. Speir.....	38,600.00	35,500.00	36,300.00	33,200.00	36,500.00	33,400.00
John Hughes, jr.....	40,000.00	36,591.65	38,000.00	34,591.65	38,200.00	34,791.65
S. S. Shedd & Bro.....	.....	.....	.....	.....	.....	3,498.35
M. B. Casey.....	.....	.....	.....	.....	.....	3,098.35
J. Nolan & Sons.....	.....	.....	.....	.....	.....	3,118.00
E. J. Hannan.....	.....	.....	.....	.....	.....	3,200.00
.....	.....	.....	.....	.....	.....	3,391.00

## Schedule of proposals for constructing an eight-room school building on California avenue, Washington Heights.

Bidder.	Steam.				Hot air.				Plumbing only.
	Complete tile roof.	Plumbing omitted.	Complete slate roof.	Plumbing omitted.	Complete tile roof.	Plumbing omitted.	Complete slate roof.	Plumbing omitted.	
N. H. Thomas.....	\$38,900	\$35,500	\$38,300	\$34,900	\$37,400	\$34,000	.....	.....	.....
Pavarini & Greer.....	41,000	38,000	40,200	37,200	38,700	35,700	37,900	34,900	.....
Gleeson & Humphrey.....	41,800	38,800	41,200	38,200	39,400	36,400	38,800	35,800	\$3,000
W. E. Speir.....	42,200	39,100	41,800	38,700	39,500	36,400	39,100	36,000	.....
E. J. Hannan.....	.....	.....	.....	.....	.....	.....	.....	.....	3,000
S. S. Shedd & Bro.....	.....	.....	.....	.....	.....	.....	.....	.....	3,098

## Proposals for constructing a four-room school building on the grounds of the Industrial Home School, Tenallytown road, opened April 20, 1901.

Bidder.	Building complete.	Without plumbing.	Plumbing only.
Pavarini & Greer.....	\$18,300	\$16,800	.....
H. E. Burgess.....	19,033	17,533	\$1,700
Gleeson & Humphrey.....	19,700	18,250	.....
N. H. Thomas.....	20,664	19,164	1,300
E. J. Hannan.....	.....	.....	1,420
S. S. Shedd & Bro.....	.....	.....	1,464

*Schedule of proposals for constructing stone wall on grounds of Dent School, South Carolina avenue and Second street SE.*

Bidder.	Seneca stone.	Seneca facing and Maynard red sandstone steps and coping.	Hummels-town or Manassas stone.
A. Mainati .....	\$1,987.00	\$1,675.00	\$1,560.70
D. Rothwell & Son .....	2,215.40	.....	.....

*Schedule of proposals for constructing chemical fire-engine house, lot 18, block 22, Lansing street, between Twelfth and Thirteenth streets, Brookland, D. C.*

Bidder.	Building complete.	Track and sleepers omitted.	Building only, no plumbing.	Plumbing only.
Gleason & Humphrey .....	\$7,240	\$178	\$6,600	.....
H. E. Burgess .....	7,517	.....	6,317	\$1,200
D. F. Mockabee .....	7,722	159	7,078	.....
Geo. W. Corbett .....	8,100	175	8,000	.....
E. J. Hannan .....	.....	.....	.....	644

*Proposals received May 18, 1901, for iron fence around Western High School.*

Design.	Champion Iron Co. (per foot).	A. F. Jorss (per foot).	Barber & Ross. <sup>1</sup>
139 .....	\$1.02	.....	.....
140 .....	1.17	.....	.....
141 .....	1.08	.....	.....
142 .....	1.23	.....	.....
129 .....	.92	.....	.....
130 .....	1.00	.....	.....
A .....	.....	\$1.20	.....
B .....	.....	1.40	.....
C .....	.....	1.45	.....
D .....	.....	1.25	.....

<sup>1</sup> Bid informal.

*Schedule of proposals for constructing four-room school building on lots 61 to 68, block 5, Kenilworth, Anacostia, opened June 15, 1901.*

Bidder.	Dark red brick, Seneca red sandstone trimmings.	Light brick, Indiana limestone trimmings.	Dark red brick, Indiana limestone trimmings.
Pavarini & Greer .....	\$25,500	\$26,000	\$24,500
Gleeson & Humphrey .....	26,000	27,000	.....

*Schedule of proposals for constructing four-room school building on lots 47 to 51, block 4, Twining City, Prout street, opened June 15, 1901.*

Bidder.	Dark red brick, Seneca red sandstone trimmings.	Light brick, Indiana limestone trimmings.	Dark red brick, Indiana limestone trimmings.
Pavarini & Greer .....	\$25,500	\$26,000	\$24,500
Gleeson & Humphrey .....	26,000	27,000	.....

186 OPERATIONS OF THE ENGINEER DEPARTMENT, D. C.

*Schedule of proposals for heating and ventilating school building, Fifteenth street NE., between Gales and Rosedale streets, opened July 2, 1900.*

Bidder.	Amount.	
	Hot air.	Steam heat.
H. I. Gregory .....	\$2,450	.....
McGinnis-Smith Co. ....	.....	\$3,950

*Schedule of proposals for repairs to and changes in plumbing in the Force School building, opened July 26, 1900.*

Bidder.	Amount.
Jas. Nolan & Sons .....	\$8,181.00
E. J. Hannan .....	7,972.50
S. S. Shedd & Bro .....	7,688.45

*Schedule of proposals received May 4, 1901, for changes in plumbing in hospital ward No. 4, Washington Asylum grounds.*

Bidder.	Amount.
S. S. Shedd & Bro .....	\$1.00
Jas. Nolan & Sons .....	200
E. J. Hannan .....	800

*Schedule of proposals received June 18, 1901, for the construction of urinals.*

Bidder.	Four urinals.	One urinal.
M. B. Casey .....	\$3,167.30	\$204
E. J. Hannan .....	2,648.00	672
Jas. Nolan & Sons .....	2,616.00	663
Wm. Rothwell .....	2,500.00	611
S. S. Shedd & Bro .....	2,084.00	524

*Schedule of proposals received for repairs to and changes in plumbing in Randall and Lincoln schools.*

Bidder.	Randall.	Lincoln.
James Nolan & Sons .....	\$6,000	\$3,865
E. J. Hannan .....	5,447	4,000
William Rothwell .....	5,338	3,907
S. S. Shedd & Bro .....	5,136	3,954

*Schedule of proposals for furnishing and setting in place two steam boilers at Franklin School building, opened July 13, 1900.*

Bidder.	Amount.
W. H. Larman .....	\$2,585
Warren W. Biggs Heating and Ventilating Co .....	2,577
Forsberg & Murray .....	2,735

# OPERATIONS OF THE ENGINEER DEPARTMENT, D. C. 187

*Proposals for constructing a rubble masonry wall, opened November 3, 1900.*

Bidder.	Per cubic yard.
Lyons Brothers .....	\$5.24
M. F. Talty .....	5.50
Pavarini & Greer .....	6.00

*Schedule of proposals for constructing two gate houses at Brightwood Reservoir, opened July 7, 1900.*

Bidder.	White marble on granite base.	Granite.	Light clouded marble, similar to that in Corcoran Art Gallery.	Cherokee, Ga., marble on granite base.	Pennsylvania marble on granite base.
D. F. Mockabee .....	\$24,154	\$23,198	\$22,365	.....	.....
J. F. Manning & Co. ....	23,980	.....	.....	.....	.....
Antonio Malnati .....	23,900	22,750	.....	.....	.....
John Hughes, jr. ....	23,292	22,100	.....	.....	.....
W. A. Kimmel .....	.....	.....	.....	\$19,991	\$19,991

*Schedule of proposals for furnishing and erecting fencing on coping at Brightwood Reservoir, opened May 25, 1901.*

Bidder.	Cost.	Bidder.	Cost.
A. F. Joras .....	\$1,550	Fred. J. White .....	\$1,920
C. A. Schneider's Sons .....	1,550	Chas. White & Co .....	2,290

*Schedule of proposals received May 4, 1901, for constructing two gate houses at the Brightwood Reservoir.*

Bidder.	Amount.	Bidder.	Amount.
W. A. Kimmel .....	\$16,053	Sam. J. Prescott & Co .....	\$17,741
D. F. Mockabee .....	19,922	Antonio Malnati .....	21,168

*Schedule of proposals for furnishing and erecting two 20,000,000-gallon pumping engines, received June 30, 1900.*

Bidder.	On D. C. specifications with-out modification.	On D. C. specifications, but with direct connected auxiliaries.	On D. C. specifications, but with direct and independent auxiliaries.	Rotary pumps driven by vertical triple expansion engines.	Rotary pumps driven by vertical quadruple expansion engines 250 pounds steam power.	Same as preceding, but including boilers.
The Edw. P. Allis Co., Milwaukee, Wis. <sup>1</sup>	\$210,000	\$148,000	\$151,000	.....	.....	.....
Camden Iron Works, Philadelphia, Pa. <sup>2</sup>	171,000	.....	170,000	.....	.....	.....
Holly Manufacturing Co., Lockport, N. Y. <sup>2</sup>	216,525	181,790	.....	.....	.....	.....
The P. H. & F. M. Roots Co., Connersville, Ind. <sup>2</sup>	2350,000	.....	.....	2220,000	2219,000	2230,000

<sup>1</sup> Formal in all respects.  
<sup>2</sup> Formal, except that no evidence is submitted, as required in paragraph 1 of specifications, that firm has built engines of size and type specified.  
<sup>3</sup> Informal. Rotary pumps specified and duty based on foot-pounds of work per million British units.

# 188 OPERATIONS OF THE ENGINEER DEPARTMENT, D. C.

*Schedule of proposals for sewerage pumping station, opened February 16,*

Bidder.	Amount.	Bidder.	A.
Camden Iron Works.....	\$11,811	Henry R. Worthington.....	
Camden Iron Works.....	16,861	United Engineering and Contracting Co.....	

<sup>1</sup> Alternate bid.

*Schedule of proposals to furnish engine, wheel, shaft, etc., for the harbor boat "Vigilant," opened April 6, 1901.*

Bidder.	A.
The James Clark Co., Baltimore, Md.....	
W. S. Moore's Sons, Alexandria, Va.....	
Forsberg & Murray.....	

*Schedule of proposal to furnish two combination chemical and hose wagons, fire department, received September 5, 1900.*

Bidder.	A.
Chas. T. Holloway & Co.....	

*Schedule of proposal for placing new boiler in the harbor boat "Vigilant," received September 12, 1900.*

Bidder.	A.
H. Boswell & Co.....	

*Proposals for removing certain buildings and obstructions in the line of El street extended, opened October 13, 1900.*

Bidder.	Item 1.	Item 2.	Item 3.	Item 4.	Item 5.	I
Geo. Simmons.....					\$210	
Fannie E. Pate.....	\$10.75					
Edwin Mormann.....		\$250		\$74	100	
Chas. M. King.....		800		300		
Rosa E. Gerhold.....			\$15			

*Schedule of proposals received June 15, 1901, for introducing water and sewerage into certain premises.*

Bidder.	A.	B.	C.	D.
Jas. Nolan & Sons.....	\$513.48	\$409.58	\$465.64	\$197.56
S. S. Shedd & Bro.....	390.00	295.50	295.25	113.50
M. B. Casey.....	339.00	190.00	191.00	194.00

**OPERATIONS OF THE ENGINEER DEPARTMENT, D. C. 189**

*Schedule of proposals received June 1, 1901, for furnishing Portland cement.*

Bidder.	Property yard.	F. o. b. B. and O.	F. o. b. P., W. and B.
Lehigh Portland Cement Co.....	\$1.44	\$1.40	\$1.40
Lawrence Cement Co.....	1.45	1.40	1.40
Alpha Portland Cement Co.....	1.46½	1.41½	1.41½
National Mortar Co.....	1.53	.....	1.48
Atlas Portland Cement Co.....	1.54	1.49	1.49
Cranford Paving Co.....	2.25	2.20	2.20
Brennan Construction Co.....	1.59	1.53	1.53

*Schedule of proposals received June 1, 1901, for furnishing natural hydraulic cement.*

	Jas. H. McGill.	National Mortar Co.	John Bullock & Son.
Canal street between Delaware avenue and First. per barrel..	\$0.64	\$0.66½	\$0.82
F. o. b. Washington, Baltimore and Ohio R. R. ....do.....	.59	.62	.72
F. o. b. Washington, Philadelphia, Wilmington and Baltimore R. R.....per barrel..	.66½	.....	.75

*Schedule of proposals for furnishing cast-iron water pipe, opened July 7, 1900.*

Bidder.	12-inch.	4-inch.	3-inch.	Total bid.	Remarks.
	<i>Per ton.</i>	<i>Per ton.</i>	<i>Per ton.</i>		
M. J. Drummond & Co.....	\$26.85	\$27.50	\$28.50	\$10,168.00	On cars Pennsylvania R. R.
United States Cast Iron Pipe and Foundry Co.....	24.90	26.90	28.90	9,745.20	On wharf; if on cars add 85 cents per gross ton.
Camden Iron Works.....	24.22	26.18	27.75	9,569.88	On wharf.

*Schedule of proposals for furnishing cast-iron water pipe, opened October 3, 1900.*

Bidder.	Per ton.	Cost.
United States Cast Iron Pipe and Foundry Co.....	\$23.40	\$18,720.00
M. J. Drummond & Co.....	23.70	18,960.00
Camden Iron Works.....	23.88	19,104.00

*Proposals for furnishing granite curbing, opened October 27, 1900.*

Bidder.	8 by 8 inches straight.	8 by 8 inches circular.	6 by 20 inches straight.	6 by 20 inches circular.
	<i>Per foot.</i>	<i>Per foot.</i>	<i>Per foot.</i>	<i>Per foot.</i>
Francis Jones & Co.....	\$0.68½	\$0.80	\$0.77½	\$1.10
J. Merrick Horn.....	.67	.87	.82	1.15
J. H. Peddicord & Son.....	.75	1.50	.95	1.95
Bath Granite Co.....	1.85	2.40	1.20	2.20
Venable Bros.....	.63	.84	.75½	.94
Geo. Peirce.....	.95	1.33	1.09	1.47
Do.....	.....	.....	.99	.....
Silas C. Doby.....	.65	.88	.76	.90
Cape Ann Granite Co. <sup>1</sup> .....	.....	.....	.....	.....

<sup>1</sup> Sample received, but no bid.

## 190 OPERATIONS OF THE ENGINEER DEPARTMENT, D. C.

Schedule of proposals received June 27, 1901, for granite curbing.

Bidder.	6 by 20 inches straight.	6 by 20 inches circular.	8 by 8 inches straight.	8 by 8 inches circular.
Rowan Granite Co.....	\$0.70	\$1.00	\$0.68	\$0.70
Dennis Mountain Granite Quarry.....	.74	.98	.68	.88
Georgia Rough and Cut Stone Co.....	.77½	1.25	.67	1.00
Francis Jones & Co.....	.79½	1.25	.74½	1.15
Brantley & Daley.....	.80	1.10	.72	1.00
Venable Bros.....	.90	1.25	.80	1.15
Chase Granite Co.....	1.06½	1.20½	.94	1.06½

Proposals for furnishing special taper section vitrified sewer invert bricks, opened November 7, 1900.

Bidders.	Price per M.
American Clay Manufacturing Co. of New Jersey.....	\$30.00
Guise Brick and Stone Co.....	14.50
Mack Manufacturing Co.....	28.50

Schedule of bids received June 1, 1901, for furnishing terra-cotta sewer pipe, branches, invert blocks, and bricks.

Material.	Poto- mac Terra Cotta Co.	Ameri- can Sewer Pipe Co.	The Robin- son Bros. Co.	Angus La- mond.	Mack Manu- factur- ing Co.	Savage Fire Brick Co.	Wm. Wirt Clarke & Sons.	Jas H. Welch.
Terra-cotta sewer pipe:								
24-inch.....	\$0.825	\$0.84825	\$0.965					
21-inch.....	.64	.6525	.745					
18-inch.....	.42	.4437	.51					
15-inch.....	.32	.33625	.38					
12-inch.....	.21	.22185	.26	\$0.205				
10-inch.....	.165	.16965	.20					
8-inch.....	.12	.1305	.15	.11				
6-inch.....	.08	.087	.10	.07				
Terra-cotta Y branches:								
24 by 6 inch.....	.325	3.55509	4.10					
21 by 6 inch.....	.250	2.73375	3.18					
18 by 6 inch.....	.175	1.85895	2.20					
15 by 6 inch.....	.125	1.36809	1.60					
12 by 6 inch.....	.90	.93069	1.20					
10 by 6 inch.....	.70	.71190	.90					
8 by 6 inch.....	.55	.5887	.60					
Reducers, 8 to 6 inch.....								
Bends:								
6-inch.....	.50	.522	.51					
8-inch.....	.29	.319	.32	.25				
8-inch.....	.50	.522	.51	.40				
Invert blocks.....								
Invert bricks:		.51		.50				
A.....		16.75			\$15.44	\$16.25	\$16.00	\$17.75
B.....		15.75					16.50	

Schedule of bids received June 1, 1901, for furnishing sewer brick.

Bidder.	Standard Brick Co.	Wm. Wirt Clarke & Sons.
In city of Washington.....	\$9.93	\$9.25
In city of Georgetown.....	10.33	
County of Washington, east of Eastern Branch.....	10.33	
County of Washington, between Eastern Branch and Rock Creek.....	10.42	
County of Washington, west of Rock Creek.....	11.92	
At bidder's works.....	8.93	6.00
Hauling brick beyond limits westward for each mile or fraction thereof.....	.75	6.50
District of Columbia property yard.....		9.80

# OPERATIONS OF THE ENGINEER DEPARTMENT, D. C. 191

*Schedule of proposals received June 1, 1901, for furnishing red sidewalk paving bricks.*

Bidder.	Price per M.
W. Wirt Clarke & Sons.....	\$11.55
Frederick Brick Works.....	11.75
Guisse Brick and Stone Co.....	15.50

*Schedule of bids received June 1, 1901, for furnishing vitrified paving blocks.*

Bidder.	Number per square yard.	Whole block, per M.	Half block, per M.
Joseph P. Mack.....	43	\$20.82	\$18.00
Camden Clay Co.....	48	20.90	10.95
American Sewer Pipe Co.....	42	20.96	13.00
Guisse Brick and Stone Co.....	44.50	21.25	15.00
W. Wirt Clarke & Sons.....	42	21.35	18.50
Do.....		21.35	13.50
Portsmouth (Ky.) Fire Brick Co.....	45	21.50	12.70
Eastern Paving Brick Co.....	43	22.00	12.00
W. Wirt Clarke & Sons.....	41	25.50	
Do.....	42	24.55	14.55
Harris Brick Co.....	42	26.25	14.00
Mack Manufacturing Co.....	42	21.33	18.00

*Schedule of proposals received June 1, 1901, for furnishing sand and gravel.*

Bidder.	Paving and concrete sand.	Building sand.	Screened gravel.
Columbia National Sand Dredging Co.....	\$0.42	\$0.49	\$0.69
L. E. Smoot.....	.44	.52½	.80

*Schedule of proposals for curb and corporation cocks, opened February 2, 1901.*

## CURB COCKS.

Bidder.		¾ inch.	1 inch.	1½ inches.	Cost.
A. P. Smith Manufacturing Co. (Inverted..)		\$1.30	\$2.00	\$3.00	\$2,380.00
(Direct.....)		.75	1.85	2.00	1,482.50
H. Mueller Manufacturing Co. (Inverted..)		1.22	2.14	3.41	2,388.50
(Direct.....)		.75	1.82	2.10	1,470.00
C. J. McCubbin..... (Inverted..)		1.08	1.90	3.00	2,113.00

## CORPORATION COCKS.

Bidder.	¾ inch.	¾ inch.	¾ inch.	1 inch.	1½ inches.	1½ inches.	Cost.
A. P. Smith Manufacturing Co.....	\$0.75	\$1.00	\$1.20	\$1.75	\$3.00	\$4.00	\$1,070.00
H. Mueller Manufacturing Co.....	.77½	.97	1.34	1.89	3.71	4.77	1,783.10

*Schedule of bids for furnishing fire hydrants, opened February 23, 1901.*

Bidder.	Cost, each.
M. J. Drummond & Co., New York, N. Y.....	\$41.40
Camden Iron Works, Philadelphia, Pa.....	43.50
Ellicott Machine Co., Baltimore, Md.....	49.75

*Schedule of bids received June 1, 1901, for hauling.*

Bidder.	Sand, per cubic yard.	Gravel, per cubic yard.	Paving bricks, per M.	Paving blocks, per M.	Curbíng.		Pipe, per ton.
					6 by 20 inches.	8 by 8 inches.	
<b>In the city of Washington:</b>							
Littlefield, Alvord & Co.....	\$0.40	\$0.40	\$1.18	\$1.68	\$0.05	\$0.04	.50
George W. Knox Express Co.....	.42	.42	1.19	1.69	.05	.04	.50
The Springmann Express Co.....	.60	.60	1.30	1.80	.06	.05	.50
Merchants' Parcel Delivery Co.....							.50
<b>In the city of Georgetown:</b>							
Littlefield, Alvord & Co.....	.49	.49	1.29	1.89	.05	.04	.50
George W. Knox Express Co.....	.50	.50	1.33	1.90	.05	.04	.50
The Springmann Express Co.....	.75	.75	1.45	2.00	.06	.05	.50
Merchants' Parcel Delivery Co.....							.50
<b>In county of Washington, east of Eastern Branch:</b>							
Littlefield, Alvord & Co.....	.40	.40	1.18	1.68	.05	.04	.50
George W. Knox Express Co.....	.50	.50	1.33	1.90	.05	.04	.50
The Springmann Express Co.....	.60	.60	1.30	1.80	.06	.05	.50
Merchants' Parcel Delivery Co.....							.50
<b>In county of Washington, between Eastern Branch and Rock Creek, not farther than 1½ miles from city limits:</b>							
Littlefield, Alvord & Co.....	.49	.49	1.29	1.89	.05	.04	.50
George W. Knox Express Co.....	.50	.50	1.35	1.95	.05	.04	.50
The Springmann Express Co.....	.70	.70	1.60	2.00	.06	.06	.50
Merchants' Parcel Delivery Co.....							.50
<b>In county of Washington, west of Rock Creek, not farther than 1 mile from limits of the city of Georgetown:</b>							
Littlefield, Alvord & Co.....	.49	.49	1.29	1.89	.05	.04	.50
George W. Knox Express Co.....	.50	.50	1.35	1.95	.05	.04	.50
The Springmann Express Co.....	.85	.85	1.60	2.00	.07	.06	.50
Merchants' Parcel Delivery Co.....							.50
<b>Additional hauling. For deliveries at points other than described above (to be added to price for deliveries at nearest point described above) for each additional mile or fraction of a mile:</b>							
Littlefield, Alvord & Co.....	.09	.09	.19	.19	.004	.004	.09
George W. Knox Express Co.....	.09	.09	.20	.30	.01	.01	.19
The Springmann Express Co.....	.15	.15	.22	.32	.01	.01	.19
Merchants' Parcel Delivery Co.....							.19
<b>Unloading from cars and hauling broken stone a not greater distance than 1 mile from points of unloading, for cars delivered within city limits and Eckington yard:</b>							
Littlefield, Alvord & Co.....		.34					
The Springmann Express Co.....		.50					
<b>Additional hauling. A distance in excess of 1 mile from point of unloading (for each additional mile or fraction of a mile over and above first mile):</b>							
Littlefield, Alvord & Co.....		.09					
The Springmann Express Co.....		.15					

The following is a list of employees who are paid from various appropriations and are employed in the record office:

One clerk, at \$4.50 per diem, "Surface appropriations."

Three clerks, at \$4 per diem, pro rata, "Sewer, water, and surface appropriations."

One clerk, at \$3 per diem, pro rata, "Sewer, water, and surface appropriations."

# INDEX.

	Page.
Report of Engineer Commissioner .....	I
Alleys:	
Paved under permit system .....	56
Paved under assessment system .....	60
Asphalt and cements:	
Report of inspector of .....	155
Asphaltic surface mixture .....	157
Proposals for laying asphalt pavements .....	180
Assessment work:	
Sewers .....	116
Sidewalks, curbs, and alleys in city .....	60
Sidewalks, curbs, and alleys in county .....	60
Basins and connections, flushing of .....	111
Bridges:	
Report of engineer of .....	84
Care of .....	90
Construction and repair of .....	90
Buildings and building inspection:	
Report of inspector of buildings .....	146
Permits issued and receipts .....	146-147
School buildings .....	146
Report of inspector of elevators .....	151
Cements:	
Report of inspector of asphalt and cements .....	155
Tests of natural and Portland cements .....	155
Proposals to furnish .....	189
Chief clerk:	
Engineer department, report of .....	168
Water department, report of .....	107
Computing engineer, report of, and accompanying tables .....	2
Table A.—Street railways in the District of Columbia, July 1, 1900 .....	
B.—Statement of character and extent of street pavements, July 1, 1900 .....	
C.—Statement of mileage of street pavements, July 1, 1900 .....	
D.—Descriptive list of street pavements, giving character, extent, cost, etc .....	
E.—Schedule of work on streets and avenues and county roads and suburban streets .....	
F.—Repairs to asphalt and concrete pavements for year ended June 30, 1900 .....	
G.—Work done at cost of railroad companies .....	
H.—Work done by day labor under appropriation for "Current repairs to streets, avenues, and alleys" .....	
I.—Regular permit work .....	
K.—Assessment work .....	
L.—Replacing and repairing sidewalks and curbs around public reservations .....	
M.—Miscellaneous work .....	
N.—Whole cost work .....	
O.—Repairs to cuts by plumbers and others .....	
Contracts:	
For streets and roads, 1900 .....	169
For sewers .....	168, 173
For construction materials .....	170
For construction, hauling, miscellaneous .....	171
For supplies .....	170

	Page.
Elevators, report of the inspector of .....	151
Employees:	
Temporary, first division .....	83
Temporary, second division .....	106, 140
On bridges and roads .....	83
In sewer and property divisions and engineer stables .....	106-163
Engineer of bridges, report of .....	84
Flushing basins and connections .....	136
Harding, Capt. Chester, report of .....	97
Highway-extension plans, report of Assistant Engineer W. P. Richards .....	161
Materials:	
Report of superintendent of property .....	163
Construction, kind and cost of .....	162, 163
Contracts for furnishing .....	169
Proposals for furnishing .....	169
Miscellaneous work:	
Streets .....	74
Sewers .....	136
Newcomer, Capt. H. C., report of .....	1
Parking commission, report of superintendent of .....	95
Pavements:	
Granite block .....	6
Vitrified brick .....	6
Asphalt block .....	6
Adjacent to railway tracks .....	53
Report of computing engineer—	
Concrete, repairs to .....	52
Laid at cost of street railways .....	53
Character and area of .....	6
Mileage of .....	6
Report of superintendent of streets .....	5
Repairs to plumbers' cuts .....	81
Proposals for .....	178, 180
Permits:	
Report of permit clerk .....	166
List of, issued during year .....	166
Permit work:	
Sidewalks, alleys, and curbs in city .....	54
Sidewalks, alleys, and curbs in county .....	111-116
Plumbers:	
Cuts in pavements, repair of .....	81
Charges against, for cuts in pavements, etc .....	81
Plumbing:	
Report of inspector of .....	144
Yard hydrant inspection .....	144
Plumbing regulations .....	144
Plumbing in public schools .....	144
Prosecutions .....	145
Public-comfort stations .....	145
Plumbing board, report of .....	145
Property:	
Report of superintendent of .....	162
(See also Materials.)	
Proposals received during year for—	
Asphalt paving, sheet and block, and making repairs to .....	180
Bricks .....	190
Bridges .....	177
Buildings .....	181
Cement sidewalks, laying of .....	180
Cement .....	189
Curb .....	189
Grading and regulating streets .....	178
Hauling materials .....	192
Paving blocks and bricks .....	191
Pipe, cast-iron water .....	189
Plumbing, repairs, and changes in schools .....	186

	Page.
Proposals received during year for—	
Sand and pebbles .....	191
Sewers .....	173
Sewer materials .....	190
Terra-cotta material .....	190
Railways, street, mileage of, in District of Columbia .....	6
Repairs:	
Streets, avenues, and alleys .....	8-52
Plumbers' cuts .....	81
Roads and suburban streets .....	8
Replacing sidewalks and curbs around reservations .....	3-72
Roads:	
Report of computing engineer .....	82
Report of superintendent of .....	82
Repair of .....	52-83
Sand:	
Report of inspector of asphalt and cements .....	155
Proposals for furnishing .....	191
Sewers:	
Report of superintendent of .....	110
Replacing obstructed .....	126
Main and pipe .....	110-114, 128
Suburban .....	111, 114, 134
Laid under permit system .....	111, 116
Laid under assessment system .....	111-120
Laid at whole cost of applicant .....	124
Flushing basins and connections .....	111
Miscellaneous work .....	136
Constructed under various appropriations, contract work .....	111
Average cost per linear foot of those constructed by day labor .....	138-140
East-side intercepting .....	11
Proposals for constructing sewers .....	168
Sidewalks:	
Around reservations .....	72
Laid under permit system, in city .....	54
Laid under permit system, in county .....	54
Laid under assessment system, in city .....	60
Laid under assessment system, in county .....	60
Street extensions:	
Report of Assistant Engineer W. P. Richards .....	161
Streets:	
Report of computing engineer .....	2
Mileage of paved .....	6
Character and area of pavement of .....	6
Report of superintendent of .....	5
Current repairs to .....	53
Miscellaneous work on .....	74
Repairs to plumbers' cuts in .....	81
Repairs to suburban streets .....	8
Subdivision of land, report of Assistant Engineer W. P. Richards .....	161
Superintendent of property, report of .....	162
Superintendent of roads, report of .....	82
Superintendent of sewers, report of .....	110
Superintendent of streets, report of .....	5
Superintendent of repairs .....	152
Superintendent of water department .....	97
Surveyor's office .....	91
Report of surveyor .....	91
Subsurface and building division, report of .....	97
Surface division, report of .....	1
Temporary employees:	
In first division .....	82
In second division .....	106, 140
On roads and bridges .....	82
In sewer and property divisions and engineer stables .....	106, 163

Tests of engineering materials:	
Report of inspector of asphalt and cements .....	
Cement, natural and Portland .....	
Asphaltic mixtures .....	
Water .....	
Trees. (See Parking commission.)	
Water, analysis of .....	
Water registrar and chief clerk, report of .....	
Water service:	
Report of Capt. Chester Harding .....	
Distribution .....	
Mains laid during the year .....	
Revenue and inspection branch .....	
Report of superintendent .....	
Length, size, and cost of mains laid during year .....	
Length, size, and cost of mains laid between 1878 and 1900 .....	
Cost of laying mains .....	
Daily consumption of water .....	
Pumped during year .....	
Pumped per day, mean .....	
Coal burned .....	
Cost of pumping during year .....	
Cost per foot for laying mains .....	
Cost of mains laid for high service from July 1, 1893 .....	
Report of water registrar and chief clerk .....	
Receipts and expenditures during year .....	
Premises supplied with Potomac water .....	
Revenues—	
Comparative statement of .....	
Miscellaneous water takers .....	
Wells, number of shallow and deep .....	
Whole cost work:	
Streets, roads, etc .....	
Sewers .....	

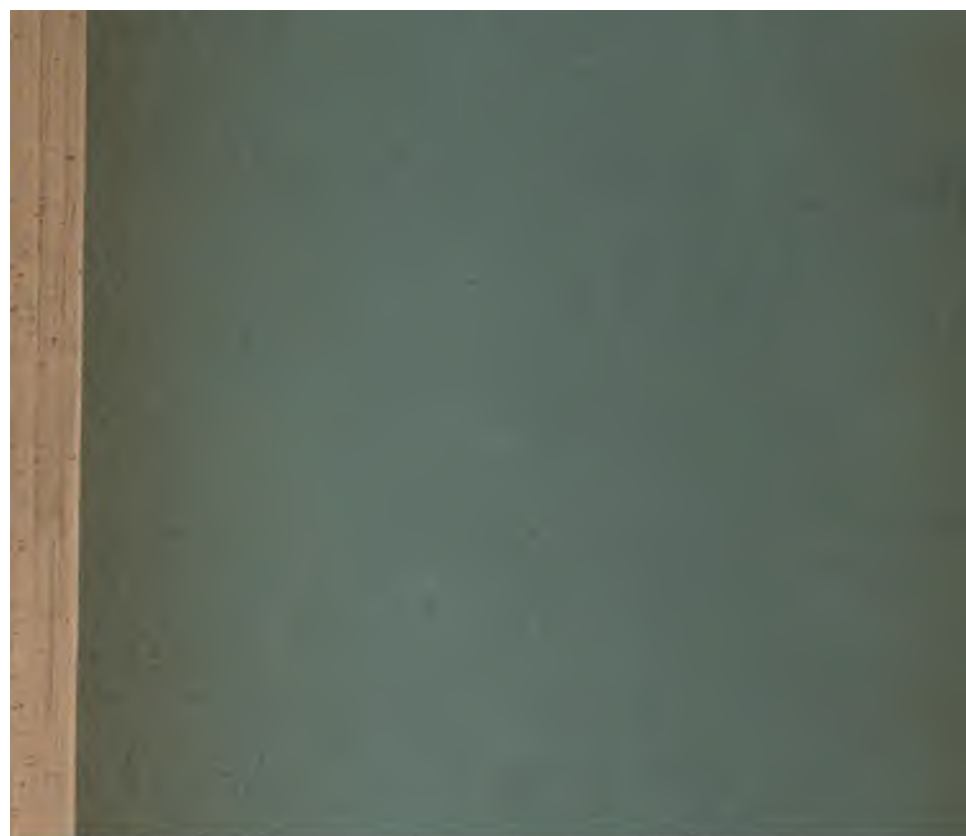
330576

---

REPORT  
OF THE  
OPERATIONS OF THE ENGINEER DEPARTMENT  
OF THE  
DISTRICT OF COLUMBIA  
FOR  
THE YEAR ENDED JUNE 30, 1902,  
UNDER THE DIRECTION OF  
CAPTAIN LANSING H. BEACH, CORPS OF ENGINEERS, U. S. A.,  
ENGINEER COMMISSIONER, DISTRICT OF COLUMBIA,  
From July 1, 1901, to October 30, 1901,  
AND  
MAJOR JOHN BIDDLE, CORPS OF ENGINEERS, U. S. A.,  
ENGINEER COMMISSIONER, DISTRICT OF COLUMBIA  
From November 1, 1901.

---

VOL. 7



---

**REPORT**  
OF THE  
**OPERATIONS OF THE ENGINEER DEPARTMENT**  
OF THE  
**DISTRICT OF COLUMBIA**  
FOR  
**THE YEAR ENDED JUNE 30, 1902,**  
UNDER THE DIRECTION OF  
**CAPTAIN LANSING H. BEACH, CORPS OF ENGINEERS, U. S. A.,**  
**ENGINEER COMMISSIONER, DISTRICT OF COLUMBIA,**  
From July 1, 1901, to October 30, 1901,  
AND  
**MAJOR JOHN BIDDLE, CORPS OF ENGINEERS, U. S. A.,**  
**ENGINEER COMMISSIONER, DISTRICT OF COLUMBIA**  
From November 1, 1901

---

*Print*



EXTRACT FROM THE REPORT OF THE COMMISSIONERS OF THE  
DISTRICT OF COLUMBIA FOR THE YEAR ENDED JUNE 30, 1902.

OFFICE OF THE COMMISSIONERS  
OF THE DISTRICT OF COLUMBIA,  
*Washington, November 10, 1902.*

The PRESIDENT:

The Commissioners of the District of Columbia herewith submit for the information of Congress, as required by law, their annual report of the official doings of the government of said District for the fiscal year which ended June 30, 1902.

\* \* \* \* \*

OPERATIONS OF THE ENGINEER DEPARTMENT.

During the fiscal year the engineer department was in charge of Capt. Lansing H. Beach, Corps of Engineers, U. S. Army, Engineer Commissioner, until November 1, 1901. The military assistants to the Engineer Commissioner during the year were Capt. H. C. Newcomer and Capt. Chester Harding, Corps of Engineers, U. S. Army.

THE UNION STATION.

It is earnestly hoped that final action will be taken this year on the bill for the union station and abolishing grade crossings within the city. Every public event that attracts an unusual crowd to the city manifests the need of better terminal facilities. Under present conditions it is necessary to lay temporary tracks and suspend the handling of freight whenever a large gathering takes place, and as Washington has many events of this kind, the need is accentuated from year to year. With the railroad companies and the Commissioners in accord upon all the material features of the improvement, it is hoped that the project will soon receive Congressional approval. A union station seems to be practically assured, the only question being that of location.

At the last session of Congress a bill was introduced in the Senate providing for the location of a union station at Delaware and Massachusetts avenues, fronting upon the latter. The bill was referred to the Commissioners for report and was recommended favorably by them, and later it passed the Senate. The bill then went to the House of Representatives and was referred to the Committee on the District of Columbia, which requested a statement from the Engineer Commissioner upon the alternative locations of the site as above, and one at C street and North Capitol street as provided by existing legislation for the station of the Baltimore and Ohio Railroad. On June 23, in response to this request, the Acting Engineer Commissioner made this report, giving the relative advantages and disadvantages of the

two sites. Congress adjourned a few days after the report was submitted, and no action was taken on the bill.

The advantages of the C street site may be briefly repeated: The engineering situation is better, this site being on the side of a hill so that there would not have to be a large fill, as in the other case; the foundations of the buildings around the station would be better and would possibly attract, at the outset, a better class of buildings; the crossing of the streets to the north of the station, with the exception of Massachusetts avenue, would be more satisfactory, as a greater track elevation would be obtained, causing less change in existing grades and permitting stone arches instead of steel girders to be used; the C street site is also nearer the lower part of Pennsylvania avenue and to the main street-car lines as they exist at present; it would cost less and cause less damage to the adjacent property, although no plan has yet been made for treating the surroundings on as large a scale as has been done in the case of the Massachusetts avenue site, and the probable necessity for buying two large squares, estimated to cost \$850,000, immediately in front would bring the cost to a figure much nearer that of the Massachusetts avenue site.

The advantages of the Massachusetts-avenue location are: It would be, in the opinion of the architects of the station, much more satisfactory with reference to the Capitol and lend itself better to the necessary development of the surroundings; Delaware avenue between Massachusetts avenue and the Capitol grounds would be saved as a boulevard; Massachusetts avenue, instead of being covered by a viaduct 800 feet long, would be open, although H street, now an important thoroughfare, would have a similar viaduct instead; the city must grow to the north, and therefore this would be nearer the center of population; the facilities for handling crowds would be much better, as in the C-street site, being situated on the side of a hill, the approaches would practically be along one or two streets, while at Massachusetts avenue there would be several wide avenues, the street cars could, of course, easily change their routes so as to accommodate themselves to any location.

As the station is to be a permanent and monumental structure, it is considered by the Commissioners that the location best adapted for the future should be chosen, even though it may involve a greater initial expense and greater temporary damage to property. The cost of the Massachusetts avenue site is stated in their report to the Senate Committee on the District of Columbia, and they are of the opinion that it is the better site.

#### STREET RAILWAYS.

The Metropolitan Railway Company was authorized by Congress to extend its line from Eighteenth street and Columbia road east on Columbia road to old Sixteenth street, thence north on old Sixteenth street to Park street, the work to be done in connection with the widening of Columbia road and old Sixteenth street. This work has been commenced. Some of the construction material has been delivered upon the ground, and it is expected that the extension will be completed within a few months.

Another extension authorized was that of the Anacostia and Potomac River Railway Company on Eleventh street from Florida avenue to Lydecker avenue. The act provides that this extension shall be made

within two years after a permit therefor is issued by the Commissioners. The Commissioners are ready to issue the permit whenever satisfactory plans are filed, but so far none have been presented. The office has been informed that the company desires to wait until the street is improved before undertaking the work of construction. In their report upon the bill for this extension the Commissioners recommended that the company be required to complete the work within two years from the date of the passage of the act; this requirement, however, was not retained in the bill as it passed.

During the year the office had removed from the streets some  $4\frac{1}{2}$  miles of abandoned street-railway tracks, the cost of which work—\$31,483.95—was paid by the railways. There are several streets yet occupied by these abandoned tracks, which will be removed, it is expected, in the near future.

#### TREE SERVICE.

Twenty-six hundred new trees were planted in the streets during the year. The varieties were elms, ginkgoes, lindens, Norway, silver, and sugar maples, and pin and willow-leaf oaks. Six hundred and forty-four trees had to be removed for various causes. There are now 84,487 trees upon the streets of the city. The land purchased for the municipal-hospital site—about 30 acres on Thirteenth street extended and Richmond street—has been utilized as an additional nursery. Seedlings to the number of 22,000 have been planted here and are doing well.

The appropriation for tree service this year is \$25,000. All labor and material are paid for from this sum. This is the same amount as was appropriated last year, although there are about 2,000 additional trees to be cared for. The amount is much too small to afford proper care and attention. Many of the trees are not yet provided with wire netting and numbers of them are killed by horses gnawing the bark. The trimming of the trees should be regular and systematic, both for their health and beauty and for the comfort of the passers-by and inhabitants of adjacent houses. The soil should be continually loosened around the roots. It takes years to grow a tree, while a short lack of proper attention may cause its death. Forty thousand dollars a year at least is needed to care for the 84,000 trees now on the streets and to permit needed extensions of the tree service. The policy of the office is to plant trees as far as sidewalks and curb are laid, but it is not always possible to do this. It is earnestly hoped that Congress will increase the appropriation to the amount asked for.

Criticisms are made from time to time as to the manner in which trees have been trimmed or removed. In this connection it should be remembered that the city tree is beset by conditions very different from those surrounding one growing in a state of nature. The root space is cramped, the surface nearly impervious, and the roots imperfectly watered. Thus it often happens that the roots are insufficient to sustain the overhead growth, which begins to fail, and the only remedy is to severely prune the tree, reducing it to a size which the roots can support. In the last few years a number of trees have had to be removed to make way for street and sidewalk work. Some varieties have been found by experience to be unsuited for street purposes, and these are eliminated as rapidly as possible. The North

## VI OPERATIONS OF THE ENGINEER DEPARTMENT, D. C.

Carolina poplar is in this class; its roots grow near the surface, where they interfere with sidewalks and curbing, and it is easily wrecked by storms. We are endeavoring to guard the trees as carefully as possible, and none is removed without good cause. Since May last a record has been kept of each tree removed. This record shows the location, variety, and nature of surroundings of the tree and the cause of its removal. It is believed that in the course of a few years this record will furnish statistics of value.

Details of the work are given in the report of Mr. Trueman Lanham, superintendent of parking, which will be found on page 93.

### BUILDINGS AND BUILDING INSPECTION.

The past year was marked by increased activity in building. The estimated value of new buildings for which permits were issued is \$8,310,240. This is a gain of more than \$2,000,000 over the preceding year. About two-thirds of this increase is in dwelling houses. As an indication of the extent to which the city is yearly pushing out beyond its original boundary it may be stated that the estimated value of new buildings erected in the county during the year is about \$2,500,000.

This growth in business has placed a heavy burden upon the office of the building inspector. Congress has added to the force of this office from year to year, but the additions have not kept pace with the increase in business. There is just complaint on the part of builders of time wasted in getting building permits. Additional force is requested.

The building inspector calls attention to the desirability of inspecting scaffoldings and derricks for the better protection of the life and limb of workmen. There have been frequent accidents due to lack of precautions in this regard, and it has been impossible for the office to give the matter the attention it deserves. With the amount of building in progress all over the District, the inspectors have only been able to give a few minutes daily to each building. An increase in the number of inspectors is requested.

During the year there were completed 12 school buildings, the Tenth precinct station house, Brookland engine house, 2 stables for the fire department, the receiving ward for the Washington Asylum, and the rear wing of the new workhouse. This work was done by contract, under the supervision of the building inspector's office.

Details of work during the year are given in the report of Mr. Snowden Ashford, inspector of buildings, which will be found on page 149.

### SURVEYOR'S OFFICE.

The work of this office has increased about one-third over what it was during the preceding year. This is largely due to activity in the real estate and building business. The new building regulations, which went into effect last March, require that the walls of all new buildings shall be located on the ground by the surveyor. This has added to the duties of the office, and while it may incur a small delay and expense to the builder at the beginning of the work, it is believed to be very desirable, insuring, as it does, against future litigations on account of encroachments on adjoining property.

Several years ago the Commissioners adopted a rule requiring that

each new house should be located on a separate lot, and that building sites should be subdivided accordingly. The object of this was to do away, as far as possible, with the necessity of describing property in the records by metes and bounds. For instance, there are cases all over the city where parts of original lots are held by different owners. These parts are described on the records by metes and bounds—a very awkward method and one in which the likelihood of errors is great. When the owner of one of these parcels applied for a permit to build he was required to have it listed as a separate lot, and a separate number given it before the permit would be issued. By this method it was hoped eventually to get all of these parcels listed under numbers of their own. The matter was taken into court, however, where it was held that the Commissioners could not compel an owner to subdivide if he did not wish to do so. The regulations were then amended, and now permits are issued upon the presentation either of a subdivision or of a plat of survey showing the location on the lot of existing and proposed buildings. As a rule, subdivisions are presented instead of plats of survey, and the designation of these separate parcels by lot and square numbers is being accomplished gradually. There is more or less objection to this requirement on the part of real estate men and builders, caused mainly by delays in having the necessary papers prepared—due to the fact that the office is at times unable, with its present force, to keep up with current business.

The appropriation for the support of the surveyor's office during the present year is \$17,800. The fees collected by the surveyor during the year just ended amounted to \$8,652.40. These fees were deposited as are other revenues of the District of Columbia.

Details of the work of the office during the year are shown in the report of Mr. H. B. Looker, surveyor, for which see page 90.

#### BRIDGES.

The office again calls attention to the serious condition of the Anacostia bridge. This bridge was built in 1875 for ordinary traffic. In recent years an electric railway has been installed upon it, carrying heavy cars, a load it was never designed to carry. The roadway is entirely taken up by car tracks and the draw arrangement is out of date. The bridge is unsightly, too narrow, and structurally unfit for the heavy traffic imposed upon it. This bridge is more used than any other of its size in the District of Columbia. An estimate for rebuilding is submitted.

The K street bridge over Rock Creek is also structurally weak and should be rebuilt as soon as possible. The estimated cost of this work is \$20,000.

The principal bridge constructed during the year was the bowlder-faced bridge across Rock Creek in Rock Creek Park. Its total cost was \$17,635.77.

The masonry arch of the Massachusetts avenue bridge across Rock Creek was completed during the year, at a total cost of \$132,005.82.

All of the foundations for the Connecticut avenue bridge over Rock Creek, from piers 2 to 9, were built up to about 3 feet of the springing line of the arches.

During the year the old footbridge over Eighth street, which for many years connected the General Post-Office building with the rented quarters opposite, was removed, the need for it no longer existing.

## VIII OPERATIONS OF THE ENGINEER DEPARTMENT, D. C.

Details of the work of the bridge department are given in the report of Mr. W. J. Douglas, engineer of bridges, for which see page 88.

### ROCK CREEK PARK.

The principal work of the year in Rock Creek Park consisted in the erection of two masonry bridges—one at the mouth of Broad Branch and the other at the site of the old Argyle dam—and the grading of about 3 miles of park roads. Some damage was done by high water during the year. The dam at Pierce mill was swept away and the dirt road above the military road was washed out in a number of places. The report of Mr. W. P. Richards, assistant engineer (which will be found on page 172), gives a detailed account of work done during the year, and other data of interest.

It is regretted that no appropriation is available for any new work in the park this year. The sum allotted—\$2,500—is barely sufficient to keep existing roads and bridges in repair. It is hoped that funds will be provided at the coming session of Congress for necessary work in the park, as large parts of the park are unimproved and consequently unused, and existing roads need thorough repairs, widening in dangerous places, and bank protection.

### STREET AND ALLEY PAVEMENTS.

The materials used for street pavements during the year were sheet asphalt, asphalt block, and macadam; 50,218 square yards of sheet asphalt, 29,859 square yards of asphalt block, and 40,276 square yards of macadam were laid. The amount of street grading was 207,130 cubic yards. The prices paid for sheet asphalt and asphalt block were \$1.72 and \$1.77 per square yard, respectively. For the coming year the prices will be \$1.56 to \$1.64 per square yard for sheet asphalt, according to the character of the base; for asphalt block, \$1.66 per square yard on gravel base, and \$2 on natural cement base.

The materials used for paving alleys were vitrified block and asphalt block; 9,969 square yards of the former and 18,095 of the latter were laid.

In the specifications for asphalt paving during the current year a requirement has been included that "the asphalt cement must be, either naturally or through artificial treatment, of such character as to be unaffected by the action of water when tested as follows: The asphalt cement shall be tested by coating it on a piece of glass and immersing this coated glass in distilled water at a temperature between 70° and 90° F. The surface of the asphalt cement must remain bright and show no corrosion or discoloration after immersion for a period of seven days."

One of the most troublesome defects in asphalt pavements is the rolling or buckling of the surface, which is noticeable upon nearly all the streets in the District of Columbia where this pavement exists; and where asphalt is so generally used as it is here the question becomes a serious one, since it has a direct bearing upon the life, usefulness, and cost of repairs of the pavement. From investigation and observation, both in this city and elsewhere, it is believed that this defect is due, in part at least, to the presence in the asphalt of soluble salts, which absorb moisture, loosen the grains of sand in the asphalt mix-

ture, and cause a disintegration which softens the pavement, so that it works into folds and ridges. Within the District of Columbia these defects are characteristic, as far as can be ascertained, of asphalt mixtures containing soluble salts, while they do not appear to any appreciable extent in other kinds which do not contain these salts.

During the present year it is, therefore, the intention to use an asphalt which is, either naturally or artificially, reasonably free from soluble salts, in the expectation of considerable improvement in the pavement. That this will prevent the action of water on the pavement is not as yet an established fact acknowledged by all, but the indications in the District of Columbia are that way, and its great importance warrants any trial that may lead to better results.

#### SIDEWALKS.

Last year the prices for cement sidewalks were 89 cents and \$1.07 per square yard, the latter price prevailing upon streets in the county not provided with roadway pavements. The prices this year are \$1.04 and \$1.11 per square yard, respectively. This increase is due to the increased cost of materials, particularly of cement. During the year 73,313 square yards of cement sidewalk were laid, an increase of more than 6,000 yards over the preceding year. There is very little demand now for brick sidewalks; less than 2,000 square yards were laid during the year.

The District appropriation act approved July 1, 1902, contains a provision that "hereafter no property except that of the United States or the District of Columbia shall be exempt from assessments for improvements." Under the old law the courts held that churches, hospitals, and other institutions exempt from taxation could not be assessed for special improvements. This prevented the construction of sidewalks on streets abutting such institutions unless they deposited half the cost of the work in advance, no matter how much the walk might be needed. By the above provision, however, this embarrassment is removed, and the department can construct walks in these cases as in the case of any other private property. An increase in the appropriation is requested. The amount up to date has been barely sufficient to keep pace with new house construction. In the heart of the city there are many old brick pavements which are much used by the public and need replacing. Where this has been requested by property owners it has usually been done. In many cases, however, the property owners object, as half the cost is assessed against the property. It is, however, a necessary public improvement gradually being accomplished, but which has been hampered by lack of funds.

#### STREET EXTENSIONS.

The most important street extension of the year was that of Sixteenth street. On March 13, 1899, an act (subsequently amended) was approved authorizing the extension of Sixteenth street from Morris street to the District line, a distance of about 5 miles. About 50 acres (more than 75 per cent of the land within the street north of Piney Branch road) were dedicated for the extension of the street. Proceedings were then undertaken for the condemnation of the remainder of the land necessary. The jury began its labors Decem-

ber 4, 1900, and rendered its verdict May 27, 1901. The verdict awarded damages to the extent of \$729,952.29. Benefits were assessed against abutting property to the amount of \$108,834.75.

The verdict was finally confirmed by the supreme court of the District of Columbia April 19, 1902. Shortly afterwards the auditor began the payment of the awards. This work necessarily has proceeded slowly, as the title to each parcel of land has to be examined before payment can be made.

During the latter part of September houses within the lines of Sixteenth street, as extended, were advertised for removal, and their removal was begun during the first week in October, it being the intention of the office to have obstructions removed from the line of the street by the first of the coming year. An item of \$50,000 has been included in the current estimates for the improvement of the street from Morris street to Piney Branch road.

Data as to the other street extensions made during the year are given in the report of Mr. W. P. Richards, assistant engineer, for which see page 171.

#### SEWAGE DISPOSAL.

The execution of the sewage-disposal project has been pushed as rapidly as available appropriations would permit. The system consists of a number of trunk sewers which will intercept and convey to the pumping station at the southern extremity of New Jersey avenue the entire sewage of the city and the storm water of the lower portion of the Tiber Valley. The sewage will be pumped from the pumping station across the Anacostia River in an inverted siphon, thence carried along the left bank of the Potomac River to near the United States naval magazine, where it will be discharged into the river. The pumping station also includes a plan for elevating the storm water of the low area of the city adjacent to Pennsylvania avenue during freshet stages of the Potomac, discharging the same into the Anacostia River.

Sewers have been completed to the amount of.....	\$648,303.54
Appropriations have been made and work will be completed during the current fiscal year to the extent of.....	625,000.00
Appropriated for work now in progress.....	1,053,109.50
The amount required to complete work in progress, for which additional appropriations will have to be made is.....	1,071,673.00
The amount required for work for which no appropriations have heretofore been made, is.....	1,006,422.00
Total estimated cost of sewage disposal project.....	\$4,502,670.04
Total appropriations to date.....	2,334,475.04
Appropriations required to complete.....	\$2,168,007.00
Appropriations required to complete.....	

Contracts have been let for the pumping station and for the principal remaining trunk sewers and work upon them is in progress, for which there has been appropriated about \$1,000,000. All of the principal work which will take any length of time to complete has been commenced. The outlet sewer and siphon have not yet been started, as it is considered more important to finish the other part of the system first. The construction of the outlet and siphon will not take over a year, and temporarily the sewage can be pumped into the river at the pumping station.

During the year 17,342 linear feet of main sewers and 52,520 linear feet of pipe sewers were constructed.

Details of the work of the sewer division are given in the report of Mr. D. E. McComb, superintendent of sewers, which will be found on page 113.

#### WATER SERVICE.

About two years ago a rigid inspection of water fixtures throughout the city was instituted. In a number of cases it was found that premises had been improperly rated, which ratings were corrected. In 1901 the revenues increased about \$20,000 over the previous year, and in 1902 there was a further increase of \$26,000. In each case the bulk of the increase was in water rents. The revenues of the water department for the year amounted to \$395,394.02. The number of premises now supplied with Potomac water is 47,801, 1,326 having been added during the year. There are 1,493 meters in use, an increase of 253 over last year.

Ten miles of new water mains were laid during the year, and 83 new fire hydrants erected.

A parcel of land 100 feet square near the Reno reservoir was purchased for the use of the water department. It is proposed to erect a water tower on this site to supply premises above the 350-foot contour.

At the Brightwood reservoir two granite gate houses were completed and an iron railing erected around the basins.

Work upon the Trumbull street pumping station has progressed satisfactorily, although there has been a slight delay due to difficulty in securing materials.

Attention is again invited to the project for the installation of a high-pressure fire service in the business section of the city. This service would add materially to the fire protection of this important part of the city, and work upon it should be started as soon as funds can be provided for the purpose. This project is described in detail in the report of Mr. W. A. McFarland, superintendent of the water department, which will be found on page 99.

#### TESTS OF MATERIALS.

It is believed that facilities should be provided for testing all important materials used in public works of the District. Asphalts and cements are now rigidly tested, with beneficial results. The office is not equipped, however, for testing such materials as coal, coke, bricks, oils, paints, etc. But little additional help would be required for this service if adequate apparatus were provided, and it would appear to be the part of wisdom and economy to establish a general testing department. The work could readily be carried on by the inspector of asphalts and cements, who is well fitted for such investigations. The office space is so limited that it would be impossible to install the necessary apparatus in our present quarters, but when the new municipal building is completed the Commissioners hope that this important matter will receive the consideration it deserves.

\* \* \* \* \*

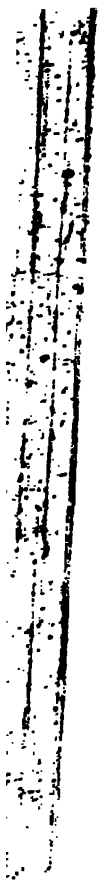
Very respectfully,

HENRY B. F. MACFARLAND,

HENRY L. WEST,

JOHN BIDDLE,

*Commissioners of the District of Columbia.*



# REPORT OF THE OPERATIONS OF THE ENGINEER DEPARTMENT.

## SURFACE DIVISION.

Capt. H. C. NEWCOMER,

*Corps of Engineers, United States Army, Assistant to the Engineer Commissioner, in charge.*

HIGHWAYS (STREETS, ROADS, BRIDGES, ETC.) .....	C. B. HUNT, <i>Computing Engineer.</i>
Sidewalks and alleys.....	H. N. MOSS, <i>Superintendent of Streets.</i>
Maintenance of county roads .....	MORRIS HACKER, <i>Superintendent of Roads.</i>
Construction and care of bridges .....	W. J. DOUGLAS, <i>Engineer of Bridges.</i>
SURVEYOR'S OFFICE.....	H. B. LOOKER, <i>Surveyor, District of Columbia.</i>
PARKING COMMISSION .....	TRUEMAN LANHAM, <i>Superintendent of Parking.</i>

## REPORT OF ASSISTANT IN CHARGE.

OFFICE OF THE ENGINEER COMMISSIONER, DISTRICT OF COLUMBIA,  
*Washington, October 7, 1902.*

MAJOR: I have the honor to transmit herewith annual reports giving in detail the operations during the fiscal year ending June 30, 1902, of the surface division, the surveyor's office, and the parking commission, namely:

Report of the computing engineer, including reports of the superintendent of streets, superintendent of roads, and the engineer of bridges.

Report of the surveyor, District of Columbia.

Report of the superintendent of parking.

Very respectfully,

H. C. NEWCOMER,

*Capt., Corps of Engineers, U. S. Army,*

*Assistant to Engineer Commissioner, District of Columbia.*

Maj. JOHN BIDDLE,

*Corps of Engineers, U. S. Army.*

*Engineer Commissioner, District of Columbia.*

## REPORT OF THE COMPUTING ENGINEER, DISTRICT OF COLUMBIA.

WASHINGTON, D. C., *July 1, 1902.*

SIR: I have the honor to submit the following report of the operations of the surface division of the engineer department of the District of Columbia for the fiscal year ended June 30, 1902.

*Summary statement of work under appropriations for "Work on sundry streets and avenues," "Construction of county roads," and "Paving roadways under permit system."*

Character of work.	Streets and avenues.	County roads and suburban streets.	Paving roadways.	Total.
Asphalt, 6-inch base.....square yards..	36,380	13,894.54		50,274.54
Vitrified-block gutters.....do.....	4,598	2,083.77		6,681.77
Cement gutters.....do.....	846.91			846.91
Asphalt block.....do.....	17,524.77	5,614.95	6,719.75	29,859.47
Macadam roadways.....do.....		40,276		40,276
Cobble gutters.....do.....		9,979		9,979
Ordinary grading.....cubic yards..	34,452.72	157,068	6,848	198,368.72
Macadam grading.....do.....	4,731.39	4,010		8,741.39
Old cobble removed.....square yards..	27,730.14	3,047		30,777.14
Old curb removed.....linear feet..	8,827.42	1,964.20		10,791.62
Curb set.....do.....	14,273.01	8,924.87	4,496.82	27,694.70
Curb reset.....do.....	13,594.97	3,012.31		16,607.28

In addition to the above, 13,113.14 square yards of asphalt and 495.63 square yards of vitrified-block gutter were laid in space of abandoned railroad tracks at cost of railroad companies.

In the report of the superintendent of streets all day-labor work under the appropriation for "Repairs to streets" is consolidated. It seems proper to segregate certain items of work, which are accordingly itemized, as follows:

The curb was reset and vitrified-block gutters laid on Louisiana avenue between Ninth and Tenth streets; the roadways of Warner street, Kirby street, Willard street, Hanover street, Seaton street, and Wiltberger street were macadamized and the gutters and sidewalks relaid where necessary; the roadway of First street SW. between Q and V streets was graveled and the gutters repaved; the roadways of South Carolina avenue SE. between Eleventh and Twelfth streets, of L street SE. between Eighth and Ninth streets, and of First street SE. between M and N streets were macadamized and the gutters relaid; the roadway of C street SE. between Twelfth and Thirteenth streets was graveled; and the roadways of Quander street SE., Park place NE., Thirteenth street NE. from B street to North Carolina avenue and from H street to Maryland avenue, F street NE. from Thirteenth street to Maryland avenue and from Fourteenth to Fifteenth streets, Sixth street NE. from H to I streets, Tennessee avenue from F to Fifteenth streets, and Fourteenth NE. from H street to Maryland avenue were macadamized and the gutters relaid and curb reset where necessary.

The principal items of work under the appropriation for "Repairs to roads" were: The grading of Detroit street from Twelfth to Thirteenth streets, Brookland; the graveled of Nichols avenue north of the asylum gate; the macadamizing of Blagden Mill road along Rock Creek; of Nebraska avenue; of the Military road; of Highland avenue; of School street; of Vermillion street, Takoma; of V street NW. between First and North Capitol streets; of Whitney avenue east of Brightwood avenue; and of Twenty-second street, Langdon, south of Cincinnati street; the resurfacing of considerable portions of Brightwood avenue and of Bunker Hill road north of Fort street, and the graveled of Bennings road westward from Central avenue.

The following is a list of tables appended with this report:

Table A.—Street railways in the District of Columbia, July 1, 1902.

B.—Statement of character and extent of street pavements, July 1, 1902.

C.—Statement of mileage of street pavements, July 1, 1902.

D.—Descriptive list of street pavements and suburban roadways, giving character, extent, cost, etc.

E.—Schedules of work on streets and avenues and county roads and suburban streets.

F.—Repairs to asphalt and concrete pavements for the year ended June 30, 1902.

G.—Work done at cost of railroad companies.

H.—Work done by day labor under appropriation for "Current repairs to streets, avenues, and alleys."

I.—Regular permit.

K.—Assessment work.

L.—Replacing and repairing sidewalks and curbs around public reservations.

M.—Miscellaneous work.

Table N.—Whole-cost work.

O.—Repairs to cuts by plumbers and others.

P.—Grading by the chain gang.

As an incident to the expenditure, by contract, of the bulk of the appropriation for "Improvements and repairs," "Repairs to concrete pavements," and "Construction of county roads," and on account of other appropriations, there were executed miscellaneous items of work by day labor during the year, as shown in detail in Table M. This work amounted to \$4,071.34.

The reports of the superintendent of streets, superintendent of roads, and the engineer of bridges are transmitted herewith.

The use of trap rock for macadam purposes was continued during the past fiscal year, the stone being secured from the quarry owned by the District of Columbia at Dickerson, Md. This material has given increasing satisfaction, and while not in every case where used the cheapest available, yet its undoubted wearing qualities justify the first cost as an economical expenditure. About 30,000 cubic yards in all were used during the year.

The labor of the chain gang was employed very advantageously throughout the year in grading various streets, avenues, and alleys (a detailed statement of which is given in Table P), and in improving Rock Creek Park. The appropriation for the hire of teams for this work is unfortunately a little less than sufficient to maintain a proper force throughout the year. The grading itemized in Table P cost about 18½ cents (including foreman's pay) per cubic yard, and was therefore decidedly economical considering the average class of material moved and length of haul. As a business proposition the appropriation for "Grading streets, alleys, and roads" should be increased from \$8,000 to \$10,000, and I so recommend.

A notable class of work during the year was that done at the cost of the Washington Railway and Electric Company in removing tracks belonging to that company, but not now operated, and paving the roadway space from which the tracks were removed to conform to the adjacent roadway pavement. Over 4½ miles of single track were so removed, pending their reconstruction as an underground electric road, at a cost to the company of \$31,483.95. A number of streets still contain these old, abandoned tracks, whose early removal under similar procedure will be the aim of this office.

Under "Construction of county roads" no less than 25 separate appropriations were expended, each in a separate locality. The practical difficulty of keeping within each small item of appropriation was very considerable, and the relative advantages of the method of appropriating for the new pavements on city streets in a single sum for each section was in striking contrast. These advantages would obtain in the case of construction of county roads if the total amount of that appropriation could be disbursed as one fund. This proposition has the approval of the district accounting officers and was recommended by me in my last annual report.

The expenditures under this office for the year from assessment and permit work largely exceeded \$250,000, divided among about 500 separate items of work, about 30 of which were alleys and the remainder sidewalks. The alleys were paved with asphalt blocks or vitrified blocks, while all the sidewalks laid were of cement except 5, which were of red brick. At present prices the cement walk is so clearly preferable to others that it is practically the only kind used.

The appropriation bill for the fiscal year 1903 provides that no property except that of the United States and the District of Columbia shall be exempt from special assessments, thus relieving this office from considerable embarrassment in cases where church and other like property formed part of a frontage under improvement.

Under the appropriation for the Bunker Hill road a radical change of the profile was made between Harewood road and the Baltimore and Ohio Railroad. The tracks of the City and Suburban Railway Company were also here relocated in the center of the roadway. Curb was set and the roadway macadamized with the funds provided, and the result is a very notable improvement.

The roadways of Cincinnati street and Connecticut avenue extended from Rock Creek to Cathedral avenue were paved with asphalt under a special appropriation for the purpose, the tracks of the Capital Traction Company being adjusted to grade and similarly paved simultaneously with the District work. A revision of the grade of Connecticut avenue extended was also made between Cleveland Park and the Pierce Mill road at a cost of nearly \$10,000 and with decided benefit to the profile of the avenue.

The work on the existing bridges and those under construction is detailed in the report of the engineer of bridges.

A bill to provide for a union passenger railroad station at the intersection of

TABLE D.—*Descriptive list of street pavements and suburban roadways.*

Street.	From—	To—	Kind of pavement or roadway.
Brentwood road	Florida avenue	District line	Gravel
Brightwood avenue	do	Pomeroy	Granite
Do	do	Grant	Granite
Do	Grant avenue	Irving	do
Do	Irving	Steuben	do
Do	do	do	do
Do	Steuben	Rock Creek Church road	Macadam
Do	Rock Creek Church road.	District line	do
Branch avenue	Pennsylvania Avenue extended.	Bowen road	Gravel
Broad Branch road			do
Brown street	Howard	Laurel	do
Bunker Hill road	Lincoln avenue	Baltimore and Ohio R. R.	Macadam
Do			Gravel
C. NW	Delaware avenue	First	Granite
Do	New Jersey avenue	do	Asphalt, H. B.
Do	Second	Third	Granite
Do	Third	Four-and-a-half	Asphalt, H. B.
Do	Four-and-a-half	Seventh	do
Do	Seventh	Eighth	Granite
Do	Ninth	Tenth	Belgian
Do	Tenth	Eleventh	Cobble
Do	Twelfth	Fifteenth	do
Do	Eleventh	Twelfth	Asphalt, H. B.
C. NE	Delaware avenue	First	Granite
Do	First	Third	do
Do	Fourth	Sixth	Asphalt block
Do	Sixth	Eighth	do
Do	Eighth	Tenth	do
Do	Tenth	Tennessee avenue	Gravel
C. SE	New York avenue	Fourth	Asphalt block
Do	Fourth	Sixth	do
Do	Sixth	Eleventh	Macadam
Do	Eleventh	Twelfth	Asphalt, H. B.
C. SW	New York avenue	First	do
Do	First	Four-and-a-half	Coal tar
Do	Four-and-a-half	Sixth	do
Do	Sixth	Seventh	Granite
Do	Ninth	Twelfth	Asphalt block
Do	Twelfth	Fourteenth	do
California	Florida avenue	Eighteenth	Asphalt, B. B.
Do	Eighteenth	Nineteenth	Asphalt, H. B.
Do	Columbia road	Phelps place	Macadam
Do	E and F, NE	First and Second	Asphalt, H. B.
Canal, east side	B. SW	C	Gravel
Canal, west side	do	do	Asphalt block
Canal	C. SW	E	Granite
Canal road	Thirty-seventh	Chain Bridge	Macadam
Cambridge	Q and U	Thirtieth and Avon	Asphalt, H. B.
Carroll	B and C, SE	First and Second	do
Carroll avenue, Takoma Park.			Gravel
Caroline	T and U	Fifteenth and Sixteenth	Asphalt, B. B.
Cathedral avenue			Macadam
Cedar	S and T	Eighteenth and Nineteenth	Asphalt, H. B.
Central			Gravel
Chapel road			do
Chapin	Fourteenth	Alley west of Fourteenth	Asphalt block
Do	Alley	Westward	Granite
Do		Fifteenth	Asphalt, B. B.
Chain Bridge road			Gravel
Chestnut (Anacostia)	Maple	Arthur	do

OPERATIONS OF THE ENGINEER DEPARTMENT, D. C. 9

with repairs to asphalt pavements to July 1, 1902—Continued.

Year laid.	Square yards.	Price per square yard.	Original cost.	Resurfaced.		Repairs—average annual cost per square yard.			Remarks.
				Year.	Cost per square yard.	Prior to resurfacing.	Since resurfacing.	Current year.	
	20,000								
1890	733	\$2.73	\$2,639.00						
1891	5,222		6,281.00						
1889	6,295		10,539.00						
1891	3,365								
1893	2,377		3,145.00						
	12,000								
	86,000								
	7,500								
	25,800								
1902	2,000		6,783.50						
	17,500								
1879	5,129								
1902	2,120				0	0	0	0	
1882	1,291	2.38	3,204.00						
1882	2,054	2.20	4,732.00			\$0.074		\$0.042	
1885	4,604	2.25	15,903.00			.034		.054	
1879	1,183	1.87	2,140.00						
1872	1,656	3.40	5,632.00						
1872	6,917								
1872		.70	4,842.00						
1897	903	1.55	2,023.00		0	0	0	0	In place of cobble.
1880	2,080	1.76	3,747.00						
1882	4,199	2.43	10,231.00						
1886	4,478	2.00	12,493.00						
1888	3,986	2.00	9,895.00						
1891	2,180	2.00	7,241.00						
1888	4,734								
1895									
1884	6,922	2.10	17,213.00						
1890	1,464	2.00	3,490.00						
1889	4,573	.57	6,314.00						
1896	1,033	1.63	2,922.00		0	0	0	0	
1889	4,919	2.00	14,706.00		0	0	0	0	4-inch base.
1887	5,941	1.99	18,086.00	1897	\$2.39	.052		0	Hydraulic base, 1897.
1897	2,273	1.97	7,916.00	1897	2.39	.069		0	Do.
1887	1,831	2.60	4,755.00						
1885	3,253	2.10	7,680.00						
1888	3,840	2.00	9,115.00						
	875				0	0	0	0	Private expense.
1890	2,153	2.25	4,473.00		0	0	0	.0053	
1891	3,169	.90	4,185.00						
1891	1,635	2.25	5,599.00		0	0	0	0	Permit work.
1899	3,687		1,094.00						
1894	1,881	2.25	4,755.00						Hydraulic base.
1890	5,186		7,548.90						
1874	45,000								
1893	1,247	2.00	2,815.00	0	0	0	0	0	
1892	1,416	2.00	6,223.00		0	0	0	0	4-inch base.
1891	5,000								
1891	1,325	2.00	4,682.00		0	0	0	0	
1901	8,708								
1899	1,546	1.76	3,296.00		0	0	0	0	
	4,800								
	4,000								
1888	483								Day labor; permit work.
1889	674		5,093.00						
1889	1,702	2.00	3,472.00		0	0	0	0	
	8,000								
	1,500								

TABLE D.—*Descriptive list of street pavements and suburban*

Street.	From—	To—	Kind of pavement or roadway.
A, NE	First	Second	Asphalt, H. B.
Do.	Second	Fourth	do
Do.	Fourth	Seventh	Coal tar
Do.	Seventh	Ninth	Asphalt block
A, SE	Second	Third	Asphalt, H. B.
Do.	Third	Sixth	Asphalt block
Do.	Sixth	Seventh	do
Do.	Seventh	North Carolina avenue	do
Acker	E and F, NE	Sixth and Seventh	do
Adams	Harrison	Jefferson	Gravel
Albemarle	Grant road	Thirty-eighth	Macadam
Do.	Thirty-eighth	Connecticut avenue	Gravel
Anacostia road	Pennsylvania avenue	District line	do
Arthur place	First, NW	New Jersey avenue	Asphalt block
Arthur street, Anacostia.	(Valley) Grant	High	Gravel
Avon	Cambridge	V	Asphalt, H. B.
B, NW	Delaware avenue	First	Asphalt block
Do.	First	Third	Granite
Do.	Sixth	Seventh	do
B, NW (north side)	Seventh	Ninth	Vitrified block
Do.	Ninth	Twelfth	do
B, NW	Seventh	Seventeenth	Cobble and rubble
Do.	Intersections Fifth and Sixth	Seventh and Sixteenth	Asphalt, H. B.
B, NE	Delaware avenue	First	Coal tar
Do.	First	Second	do
Do.	Second	Fourth	Asphalt, H. B.
Do.	Fourth	Sixth	do
Do.	Sixth	Massachusetts avenue	Coal tar
Do.	Massachusetts avenue	Ninth	Asphalt, H. B.
Do.	Ninth	Eleventh	Gravel
Do.	Eleventh	Fourteenth	do
B, SE	New Jersey avenue	Second	Granite
Do.	do	do	Coal tar
Do.	First	do	Asphalt, H. B.
Do.	Second	Fifth	do
Do.	Fifth	North Carolina avenue	Coal tar
Do.	North Carolina avenue	Eleventh	Asphalt block
Do.	Eleventh	Nineteenth	Macadam
B, SW	First	New Jersey avenue	Granite
Do.	do	Maryland avenue	do
Do.	Sixth	Fourteenth	Asphalt, H. B.
Bacon, NW	Fourteenth	Fifteenth	Gravel
Baltimore	Columbia road	Nineteenth	Asphalt, H. B.
Do.	Nineteenth	Twentieth	Asphalt block
Bancroft	Connecticut avenue	Phelps place	Asphalt, H. B.
Bates road			Gravel
Belmont	Eighteenth	Columbia road	Asphalt, H. B.
Belt road			
Benning road	Fifteenth	Eastward	Asphalt, H. B.
Do.	do	do	Granite
Do.		To Benning Bridge	Macadam
Benning and Anacostia roads.			do
Benning road	Minnesota avenue	District line	Gravel
Binney	Fourteenth	Fifteenth	Macadam
Bladensburg road	Florida avenue		Asphalt, H. B.
Do.	do	District line	Macadam
Blair road	Umatilla	do	Gravel
Blagden avenue			Macadam
Blagdens Mill road			Gravel
Brentwood road	Florida avenue	Patterson	Macadam

with repairs to asphalt pavements to July 1, 1901—Continued.

Year laid.	Square yards.	Price per square yard.	Original cost.	Resurfaced.		Repairs—average annual cost per square yard.			Remarks.
				Year.	Cost per square yard.	Prior to resurfacing.	Since resurfacing.	Current year.	
	2,430								
1894	6,698								
1900	5,365	\$1.735							
1902	9,702	1.72	\$30,131.57						
1896	1,297								Permit work.
1892	2,221	2.00	5,732.00		0	0	0	0	
1873	2,689	3.20	8,596.00			\$0.035		\$0.082	
1901	3,232	1.79							
1900	2,448	1.77	4,690.00						
1902	2,177	1.72	4,741.13						
	10,323								
1900	3,775								
1873	36,246	3.20	115,988.00	1878	\$1.22				
				1884	.257		\$0.060		
				1887	.260		.008		
				1895	.297		.017		
				1897	.226		.001	.0083	
1894	140	1.68	185.00	1902					
1894	1,507	1.68							Private expense
1897	11,011	1.77	29,742.00						
1891	2,195	2.00	3,951.00		0	0	0	.014	Permit work.
	1,000								
	62,300								
	30,000								
1877	2,067	2.18	4,507.00	1896	1.46	.03	.052	.049	
1875	2,129	3.00	6,388.00			.012		0	
1888	4,551	2.00	17,452.00			.021		.039	4-inch base.
1890	1,163	2.25	4,842.00		0	0	0	0	
1902	966	1.72	2,584.05						
1894	1,617	3.44	5,559.00						
1875	3,818	3.00	11,455.00	1883	1.51	.071	.085	.025	On asphalt block.
1889	328				0	.032	0	.024	
1879	6,278		11,613.00		0	0	0	0	On granite block.
1895	936	1.38	1,289.00		0	0	0	0	
1899	1,374	1.76	4,679.00		0	0	0	0	
1873	1,569	1.50	2,353.00						
1873	2,105	.70	1,473.00						On cobble.
1895	1,679		2,875.00						
1891	2,788	2.25	10,282.00		0	0	0	0	
1901	2,902								
1892	4,117	2.00	11,595.00		0	0	0	0	
1899	3,922	1.76	8,282.00		0	0	0	0	
1897	1,641	1.63	4,257.00		0	0	0	0	
1901	5,028	1.79			0	0	0	0	
1902	3,274	2.00	7,595.00		0	0	0	.0176	4-inch base.
1899	4,394	2.00	11,232.00						
1890	3,800	2.00	9,979.00						
1897	1,708	1.77	3,638.00						
1900	323	1.77	744.00						
1896	2,064	1.84	4,467.00						
1895	6,831		4,046.00						
1899	4,329	2.00	12,456.00		0	0	0	.016	
1891	2,905	2.25	10,721.00		0	0	0	0	
1887	2,363	1.99	7,068.00		0	.066		.124	
1875	4,079	1.50	6,119.00						
1873	6,736	.70	4,715.00						
	17,000								
1896	1,967								Permit work.
1879	2,056	1.92	3,951.00						

TABLE D.—*Descriptive list of street pavements and suburban roadways.*

Street.	From—	To—	Kind of pavement or roadway.
Brentwood road.....	Florida avenue.....	District line.....	Gravel.....
Brightwood avenue.....	do.....	Pomeroy.....	Granite.....
Do.....	do.....	Grant.....	Granite.....
Do.....	Grant avenue.....	Irving.....	do.....
Do.....	Irving.....	Steuben.....	do.....
Do.....	do.....	do.....	do.....
Do.....	Steuben.....	Rock Creek Church road.....	Macadam.....
Do.....	Rock Creek Church road.....	District line.....	do.....
Branch avenue.....	Pennsylvania Avenue extended.....	Bowen road.....	Gravel.....
Broad Branch road.....	do.....	do.....	do.....
Brown street.....	Howard.....	Laurel.....	do.....
Bunker Hill road.....	Lincoln avenue.....	Baltimore and Ohio R. R.....	Macadam.....
Do.....	do.....	do.....	Gravel.....
C, NW.....	Delaware avenue.....	First.....	Granite.....
Do.....	New Jersey avenue.....	do.....	Asphalt, H. B.....
Do.....	Second.....	Third.....	Granite.....
Do.....	Third.....	Four-and-a-half.....	Asphalt, H. B.....
Do.....	Four-and-a-half.....	Seventh.....	do.....
Do.....	Seventh.....	Eighth.....	Granite.....
Do.....	Ninth.....	Tenth.....	Belgian.....
Do.....	Tenth.....	Eleventh.....	Cobble.....
Do.....	Twelfth.....	Fifteenth.....	do.....
Do.....	Eleventh.....	Twelfth.....	Asphalt, H. B.....
C, NE.....	Delaware avenue.....	First.....	Granite.....
Do.....	First.....	Third.....	do.....
Do.....	Fourth.....	Sixth.....	Asphalt block.....
Do.....	Sixth.....	Eighth.....	do.....
Do.....	Eighth.....	Tenth.....	do.....
Do.....	Tenth.....	Tennessee avenue.....	Gravel.....
C, SE.....	New York avenue.....	Fourth.....	Asphalt block.....
Do.....	Fourth.....	Sixth.....	do.....
Do.....	Sixth.....	Eleventh.....	Macadam.....
Do.....	Eleventh.....	Twelfth.....	Asphalt, H. B.....
C, SW.....	New York avenue.....	First.....	do.....
Do.....	First.....	Four-and-a-half.....	Coal tar.....
Do.....	Four-and-a-half.....	Sixth.....	do.....
Do.....	Sixth.....	Seventh.....	Granite.....
Do.....	Ninth.....	Twelfth.....	Asphalt block.....
Do.....	Twelfth.....	Fourteenth.....	do.....
California.....	Florida avenue.....	Eighteenth.....	Asphalt, B. B.....
Do.....	Eighteenth.....	Nineteenth.....	Asphalt, H. B.....
Do.....	Columbia road.....	Phelps place.....	Macadam.....
Do.....	E and F, NE.....	First and Second.....	Asphalt, H. B.....
Canal, east side.....	B, SW.....	C.....	Gravel.....
Canal, west side.....	do.....	do.....	Asphalt block.....
Canal.....	C, SW.....	E.....	Granite.....
Canal road.....	Thirty-seventh.....	Chain Bridge.....	Macadam.....
Cambridge.....	Q and U.....	Thirtieth and Avon.....	Asphalt, H. B.....
Carroll.....	B and C, SE.....	First and Second.....	do.....
Carroll avenue, Takoma Park.....	do.....	do.....	Gravel.....
Caroline.....	T and U.....	Fifteenth and Sixteenth.....	Asphalt, B. B.....
Cathedral avenue.....	do.....	do.....	Macadam.....
Cedar.....	S and T.....	Eighteenth and Nineteenth.....	Asphalt, H. B.....
Central.....	do.....	do.....	Gravel.....
Chapel road.....	do.....	do.....	do.....
Chapin.....	Fourteenth.....	Alley west of Fourteenth.....	Asphalt block.....
Do.....	Alley.....	Westward.....	Granite.....
Do.....	do.....	Fifteenth.....	Asphalt, B. B.....
Chain Bridge road.....	do.....	do.....	Gravel.....
Chestnut (Anacostia).....	Maple.....	Arthur.....	do.....

OPERATIONS OF THE ENGINEER DEPARTMENT, D. C. 9

repairs to asphalt pavements to July 1, 1902—Continued.

Square yards.	Price per square yard.	Original cost.	Resurfaced.		Repairs—average annual cost per square yard.			Remarks.
			Year.	Cost per square yard.	Prior to resurfacing.	Since resurfacing.	Current year.	
20,000								
733	\$2.73	\$2,639.00						
5,222		6,281.00						
6,285		10,539.00						
3,365								
2,377		3,145.00						
12,000								
86,000								
7,500								
25,800								
2,000								
		6,783.50						
17,500								
5,129				0	0	0	0	
2,120								
1,291	2.38	3,204.00						
2,054	2.29	4,732.00			\$0.074		\$0.042	
4,604	2.25	15,903.00			.034		.054	
1,183	1.87	2,140.00						
1,656	3.40	5,632.00						
6,917	.70	4,842.00						
903	1.55	2,023.00		0	0	0	0	In place of cobble.
2,080	1.76	3,747.00						
4,199	2.43	10,231.00						
4,478	2.00	12,493.00						
3,986	2.00	9,895.00						
2,180	2.00	7,241.00						
4,734								
6,922	2.10	17,213.00						
1,464	2.00	3,490.00						
4,573	.57	6,314.00						
1,033	1.63	2,922.00		0	0	0	0	
4,919	2.00	14,706.00		0	0	0	0	4-inch base.
5,941	1.99	18,086.00	1897	\$2.39	.052		0	Hydraulic base, 1897.
2,273	1.97	7,916.00	1897	2.39	.009		0	Do.
1,831	2.60	4,755.00						
3,253	2.10	7,880.00						
3,840	2.00	9,115.00						
875				0	0	0	0	Private expense.
2,153	2.25	4,473.00		0	0	0	.0053	
3,169	.90	4,185.00						
1,635	2.25	5,509.00		0	0	0	0	Permit work.
3,687		1,094.00						
1,881	2.25	4,755.00						Hydraulic base.
5,186		7,548.90						
45,000								
1,247	2.00	2,815.00	0	0	0	0	0	
1,416	2.00	6,223.00		0	0	0	0	4-inch base.
5,000								
1,325	2.00	4,682.00		0	0	0	0	
8,768								
1,546	1.76	3,206.00		0	0	0	0	
4,860								
4,000								
483								Day labor; 1 work.
674		5,693.00						
1,702	2.00	3,472.00		0	0	0	0	
8,000								
1,500								

TABLE D.—*Descriptive list of street pavements and suburban roadways.*

Street.	From—	To—	Kind of pavement or roadway.
Chestnut (Takoma Park).			Gravel
Champlain avenue	Florida avenue	Columbia road	Macadam
Cincinnati	Eighteenth	Rock Creek	Asphalt, H. B.
Do.	West of	Rock Creek.	Asphalt
Cleveland place	W and Florida avenue.	Twelfth and Thirteenth	Asphalt block
Clifton	Thirteenth	Fourteenth	Asphalt, B. B.
Columbia	O and Q	Ninth and Tenth	Coal tar
Do.	Sherman avenue	Thirteenth	Asphalt, H. B.
Do.	Thirteenth	Fourteenth	Asphalt block
Columbia road	West of	Fourteenth.	Asphalt
Do.	Fourteenth	Eighteenth	Macadam
Concord	Tenth NE	Thirteenth	do.
Connecticut avenue	H	Florida avenue	Coal tar
Do.	Intersection of	Florida avenue.	Asphalt, H. B.
Connecticut avenue (west side).	Florida avenue	Leroy place	do.
Connecticut avenue and Columbia road.		Eighteenth	do.
Connecticut avenue	California	Kalorama	Asphalt, B. B.
Do.	North of	Kalorama.	do.
Do.	Rock Creek	District line	Macadam
Conduit road			do.
Corcoran	Q and R	Thirteenth and Fourteenth.	Coal tar
Do.	do.	Fourteenth and Fifteenth.	do.
Do.	do.	Fifteenth and New Hampshire avenue.	Asphalt, H. B.
Do.	do.	New Hampshire avenue and Nineteenth.	do.
Crescent	Sixteenth	Westward	Asphalt block
D, NW	North Capitol	New Jersey avenue	Granite
Do.	New Jersey avenue	Fourth	Coal tar
Do.	Fifth	Sixth	Asphalt
Do.	Sixth to Eighth	Ninth to Tenth.	Granite
Do.	Eighth	Ninth	Asphalt
Do.	Eleventh	Twelfth	Asphalt, H. B.
Do.	Twelfth	Fourteenth	Rubble
Do.	do.	do.	Cobble
Do.	Fourteenth	Fifteenth	Asphalt
Do.	Seventeenth	Eighteenth	Asphalt, H. B.
Do.	Eighteenth	Twentieth	Macadam
D, NE	Delaware avenue	Massachusetts avenue.	Asphalt, B. B.
Do.	Massachusetts avenue.	Maryland avenue	Asphalt, H. B.
Do.	Seventh	Ninth	do.
Do.	Ninth	Thirteenth	do.
D, SE	South Capitol	First	do.
Do.	First	Third	Asphalt block
Do.	Third	Sixth	do.
Do.	Sixth	Seventh	do.
Do.	do.	do.	do.
Do.	Seventh	Ninth	do.
Do.	Ninth	Kentucky avenue	Gravel
D, SW	South Capitol	First	Asphalt, B. B.
Do.	First	Third	Asphalt, H. B.
Do.	Third	Four-and-a-half	Coal tar
Do.	Four-and-a-half	Seventh	Rubble
Do.	Seventh	Fourteenth	Cobble
Daniels road			Gravel
Defrees	H and I, NW	North Capitol and First	Asphalt block
Delaware avenue	B, N	C, N	Granite

with repairs to asphalt pavements to July 1, 1902—Continued.

Year laid.	Square yards.	Price per square yard.	Original cost.	Resurfaced.		Repairs—average annual cost per square yard.			Remarks.
				Year.	Cost per square yard.	Prior to resurfacing.	Since resurfacing.	Current year.	
1894	2,360	\$2.18	\$4,899.00		0	0	0	0	Hydraulic base.
1894	2,694		13,316.00						
1894	1,711								
1898	8,339	2.00	19,797.00	1901		\$0.044		0	
1897	1,308	1.63	2,724.00		0	0	0	0	
1898	8,057	1.57	19,587.00		0	0	0	0	
1900	3,024	1.80	8,677.00		0	0	0	0	
	3,000								
1900	2,466	1.77	4,072.00						
1892	6,779	2.42	20,496.00						
1874	4,315	3.20	13,808.00	1880	\$1.11		\$0.019	\$0.0037	Permit.
1896	3,973	1.77	8,689.00						
	2,000								
1901	4,700								
	3,270	1.77	7,619.00						
1900	8,416								
1896	5,840	1.63	13,403.00		0	0	0	0	
1891	5,080	.99	8,826.00						
1890	3,154	2.00	9,042.00		0	0	0	0	
1898	7,208	2.00	18,132.00			.022		.055	
1875	2,304	3.50	8,063.00						4-inch base
1875	20,436	1.50							
1876	6,032	1.50	9,048.00						
1875	4,500								
1895	2,435	1.94	4,911.00		0	0	0	0	
1897	2,645	1.63	5,305.00		0	0	0	0	
1875	1,906	1.94	4,713.00		0	0	0	0	
1890	3,000								
1895	2,402	1.94	6,767.00		0	0	0	0	
1890	6,428	1.76	15,184.00		0	0	0	0	
1895	3,042	.57	2,288.00						Private cost.
1897	8,793	.86	9,793.00						
1896	6,314	.77	6,788.00						
1892	13,109	.99	24,790.00						
	5,000								
	2,380				0	0	0	0	
	5,000								
	2,000								
1899	1,692	2.00	4,218.00		0	.004		0	
1897	3,802	1.98	10,809.00		0	.034		.06	
1872	9,179	3.20	29,373.00	1879	.75		.042	.009	In place of coal tar. Widening.
1894	1,394	2.18	3,883.00						
1901	1,281								
1872	2,514	3.20	8,045.00	1884	1.56	.014	.047	.0063	
				1878	.80	.017			
1872	12,583	3.20	40,267.00	1886	.315				
				1889					
1895	1,565	2.19	3,715.00						
1900	1,147								
1872	10,275	3.20	32,882.00	1878	1.40		.028		
				1882			.039		Do.
				1892			.014	.0012	
				1899					
1873	9,511	3.50	33,288.00						
1890	2,308	2.00	7,420.00			.017		.004	
1902	4,178	1.77	12,006.72						
1898	2,100	.23	2,966.00						
1891	1,768	.96	3,212.00						
1897	552	1.63			0	0	0	0	
1894	5,300								In place of coal tar.
1891	1,730	2.00	8,085.00						
1893	3,737	1.05	11,399.00						
1891	6,517		18,690.00						
1898	2,476		5,545.00		0	0	0	0	
1874	5,933	3.20	18,986.00	1881	1.46		.015	0	

# 17 REPORTS OF THE ENGINEER DEPARTMENT, D. C.

TABLE D—List of street pavements and suburban roadways.

	From—	To—	Kind of pavement or roadway.
	Fourth	Water	Capital
	Fifth	Seventeenth	Asphalt block
	Thirteenth	Thirtieth	Macadam
	Florida avenue	Florida avenue	Cobble
	Seventeenth	Eighteenth	do
	First H. NW	Ninth and Tenth	Asphalt, H. B.
	Fourth	Fifth	Gravel
	North Capitol	First	Asphalt, H. B.
	First	Fourth	Granite
	First	Seventh	Coal tar
	Seventh	Thirteenth	do
	Thirteenth	Fourteenth	do
	Fourteenth	Fifteenth	Asphalt, H. B.
	Fifteenth	Vermont avenue	do
	Fourth of avenue	Connecticut avenue	Asphalt
	Connecticut avenue	Pennsylvania avenue	Asphalt, H. B.
	Pennsylvania avenue	Twenty-second	Coal tar
	Twenty-second	Twenty-third	Asphalt, H. B.
	Twenty-third	Twenty-fifth	Cobble
H. NE	North Capitol	First	Asphalt, H. B.
H. NE	First	Fifteenth	do
H. NE	do	do	Asphalt, B. B.
H. SW	do	First	Macadam
H. SE	First	Second	Gravel
H. SW	do	Third	Asphalt, B. B.
do	Third	Four and a-half	Asphalt, H. B.
do	Fourth and a-half	Seventh	do
do	Seventh	Ninth	do
do	Ninth	Water	Granite
Harrison street			Gravel
Harrison		Navy-yard bridge eastward.	Vitrified brick
do		Extended to Minnesota avenue.	Asphalt, H. B.
do			do
Harrison	Tenth	Thirteenth	Gravel
Harrison	Brigade avenue	do	do
do	Thirteenth	Fourteenth	Asphalt block
Hill	Maple	Arthur	Gravel
Hickman, SE	First and Second	E and F	Asphalt block
Hillier	Q and R	Twentieth and Twenty-first	do
Holmes	Whitney avenue	Spring road	Gravel
Hopkins	O and P	Twentieth and Twenty-first	Asphalt
Howard	Brightwood avenue	Sixth	Macadam
do	Fourteenth	Seventeenth	do
do	Eighteenth	500 feet west	do
Huntington place	Fourteenth	University place	Asphalt block
I. NW	North Capitol	New Jersey avenue	Coal tar
do	Second	Fifth	Asphalt, H. B.
do	Fifth	Eighth	do
do	Eighth	Ninth	do
do	Ninth	Tenth	do
do	Tenth	Eleventh	do
do	Eleventh	Thirteenth	Coal tar
do	Thirteenth	Fifteenth	Asphalt, H. B.
do	Fifteenth	Seventeenth	Coal tar
do	Seventeenth	Eighteenth	Asphalt, H. B.
do	Eighteenth	Pennsylvania avenue	do
do	Pennsylvania avenue	Twenty-third	Asphalt
do	Twenty-third	New Hampshire avenue	Asphalt, H. B.

repairs to asphalt pavements to July 1, 1902—Continued.

r	Square yards.	Price per square yard.	Original cost.	Resurfaced.		Repairs—average annual cost persquare yard.			Remarks.
				Year.	Cost per square yard.	Prior to resurfacing.	Since resurfacing.	Current year.	
	4,500								
	2,304	\$0.57	\$4,018.00						
	4,727	.91	10,189.00						
	3,600	.671	3,430.00						
	6,000								
	2,403	3.70	9,225.21			\$0.012		\$0.004	
	675								
	1,360								
	3,600	1.98	10,000.81			.0088		.014	
	2,404	1.98	6,900.00		0	0	0	.023	
	4,982	1.47	7,367.00		0	.039	0	.029	
	9,323	1.75	16,335.00	1891	\$1.38	.066	\$0.018	.0037	
	2,487	2.00	5,386.00						
	1,003		2,936.00						In place of asphalt block.
	3,031	1.30	5,294.00		0	0	0	.002	Cobble base.
	4,637	.70	3,247.00						
	1,642	3.30	5,244.00	1878	1.44		.022	.022	North side Rawlins square.
	4,891	.55	2,657.00						
	959	1.72	2,473.67						
	2,913		10,246.00						
	5,640	2.00	16,004.00						
	6,000								
	5,693	1.84	13,966.00						
	891	1.77	2,563.00						
	7,492		11,987.00						
	1,118	1.794	2,860.00		0	0	0	0	
	498	1.72	1,696.04						
	3,840	2.00	9,890.00		0	0	0	0	
	671	1.90	1,650.00		0	0	0	0	
	2,363	1.63	4,704.00		0	0	0	0	
	3,607	1.57	9,453.00		0	0	0	0	
	3,000								
	3,104	2.00	7,050.00		0	0	0	.0006	
	1,580		3,768.00						In place of bitumen base.
	2,371	1.97	5,785.00	1902	0	.043		.034	
	4,286	1.85	9,672.00		0	.0088		.0095	
	6,867	2.25	19,367.00		0	0	0	.001	
	10,511	2.041	21,822.00	1889	1.37	.082	.012	.0038	
	6,989	2.25	16,462.00		0	.019		.054	
	4,076	1.77	7,186.00		0	0	0	0	Macadam base.
	3,738	1.76	7,676.00		0	0	0	0	
	5,496	1.72	11,648.74						
	1,560	2.25	4,472.00		0	0	0	0	
	1,033	1.72	3,164.22						
	1,949	2.00	4,534.00		0	0	0	0	
	6,000								
			2,173.66						
	1,606	2.00	3,860.00		0	0	0	0	
	5,601					.054		.002	
	2,962	1.98	8,743.00	1900		.054	0	.01	
	4,382	1.47	6,454.00	1892	.675	.024		.046	
	2,731	3.25	8,875.00			.022		.0005	
	2,359	1.78	4,199.00	1889	.93	.035	.031	.0074	
	1,913	3.25	6,217.00	1891	1.61	.082	.02	.0014	
	527	1.93	1,017.26						
	4,257	2.09	11,151.00	1890	1.76	.05	.01	.0067	
	2,103	1.74	3,660.00	1882	1.07		.011		
				1891	1.20		.04	0	
	6,467	3.20	20,694.00	1882	.700	.003		.001	
	2,856	1.85	5,372.00	1891	.714	.033	.08	.021	
						.014		0	
	8,790	3.20	28,128.00	1878	1.34		.008	0	
				1897	1.73		.028	0	
				1900	.96				

## 18      OPERATIONS OF THE ENGINEER DEPARTMENT. D. C.

TABLE D.—*Descriptive list of street pavements and suburban roadways.*

Street.	From—	To—	Kind of pavement or roadway.
I. NW .....	New Hampshire avenue.	Twenty-sixth.....	Asphalt. H. B.
I. NE .....	North Capitol .....	First .....	Asphalt. B. B.
Do .....	Sixth .....	Seventh .....	Macadam .....
Do .....	Seventh .....	Florida avenue .....	Gravel .....
I. SE .....	South Capitol.....	New Jersey avenue .....	Granite .....
Do .....	Second .....	Third .....	Macadam .....
Do .....	Third .....	Eighth .....	do .....
Do .....	Eighth .....	Eleventh .....	Asphalt. H. B.
Do .....	Eleventh .....	Thirteenth .....	Gravel .....
I. SW .....	Canal .....	First .....	Macadam .....
Do .....	First .....	Third .....	Gravel .....
Do .....	Third .....	Sixth .....	Asphalt block .....
Do .....	Sixth .....	Water .....	Gravel .....
Illinois avenue.....	Rock Creek Church road.	Grant circle .....	do .....
Irving place .....	Thirtieth .....	Avon .....	Asphalt. H. B.
Irving .....	Brightwood avenue .....	Thirteenth .....	Gravel .....
Indiana avenue .....	First .....	Third .....	Asphalt .....
Indiana and Louisiana avenues.	Third .....	Seventh .....	Granite .....
Do .....	do .....	do .....	Asphalt. H. B.
Do .....	do .....	do .....	Vitrified block .....
Jackson .....	G and H .....	First E and First W .....	Cobble .....
Do .....	Nichols avenue .....	Taylor .....	Gravel .....
James .....	G and H, NE .....	Twelfth and Thirteenth NE.	Macadam .....
Jefferson .....	K (Georgetown) .....	M .....	Cobble .....
Do .....	Nichols avenue .....	Taylor .....	Gravel .....
Jefferson place .....	M and N, NW .....	Eighteenth and Nineteenth.	Asphalt block .....
Johnson .....	R and S .....	Fourteenth and Fifteenth.	Asphalt. B. B.
Joliet .....	Connecticut avenue .....	Zoo entrance .....	Macadam .....
Do .....	Wisconsin avenue .....	Tenallytown road .....	do .....
K. NW .....	North Capitol.....	First .....	Asphalt. H. B.
Do .....	First .....	Third .....	Asphalt .....
Do .....	Third .....	Seventh .....	Coal tar .....
Do .....	North side Mount Vernon square.		do .....
Do .....	South side Mount Vernon square.		Asphalt. H. B.
Do .....	Ninth .....	Eighteenth .....	Coal tar .....
Do .....	Eighteenth .....	Twenty-third .....	Asphalt. H. B.
Do .....	Twenty-third .....	Rock Creek .....	Trap rock .....
Do .....	Rock Creek .....	Aqueduct Bridge .....	Seneca stone .....
K. NE .....	North Capitol .....	First .....	Asphalt. B. B.
Do .....	First .....	Seventh .....	Gravel .....
Do .....	Eleventh .....	Twelfth .....	Macadam .....
K. SE .....	South Capitol .....	Second .....	do .....
Do .....	Second .....	Sixth .....	Gravel .....
Do .....	Virginia avenue .....	Fourteenth .....	do .....
K. SW .....	South Capitol .....	First .....	Granite .....
Do .....	First .....	Water .....	Macadam .....
Kalorama .....	Eighteenth .....	Columbia road .....	Asphalt block .....
Do .....	Nineteenth .....	Westward .....	Asphalt .....
Kansas avenue .....	Brightwood avenue .....	Trenton .....	Gravel .....
Kenesaw .....	Brightwood avenue to Thirteenth and Fourteenth to Sixteenth.		do .....
Do .....	Thirteenth .....	Fourteenth .....	Asphalt block .....
Kenesaw and Park road .....		do .....	Macadam .....
Kentucky avenue .....	East Capitol .....	B .....	Gravel .....
Kenyon .....	Thirteenth .....	Fourteenth .....	Asphalt. H. B.
Kingman place .....	P and Q, Thirteenth and Fourteenth.		Asphalt .....

OPERATIONS OF THE ENGINEER DEPARTMENT, D. C. 15

repairs to asphalt pavements to July 1, 1902.—Continued.

No.	Square yards.	Price per square yard.	Original cost.	Resurfaced.		Repairs—average annual cost per square yard.			Remarks.
				Year.	Cost per square yard.	Prior to re-surfacing.	Since re-surfacing.	Current year.	
4	2,380	\$2.18½	\$4,899.00		0	0	0	0	Hydraulic base.
4	2,684		13,816.00						
4	1,711		19,797.00	1901		\$0.044		0	
8	8,359	2.00	2,724.00		0	0	0	0	
7	1,308	1.63	19,587.00		0	0	0	0	
8	8,057	1.57	8,677.00		0	0	0	0	
0	3,024	1.80	4,072.00		0				Permit.
0	3,000		20,496.00						
2	2,466	1.77	13,806.00	1890	\$1.11		\$0.019	\$0.0037	
0	6,779	2.42	8,689.00						
4	4,315	3.20	7,619.00						
6	3,973	1.77	13,403.00		0	0	0	0	
1	2,000		8,826.00		0	0	0	0	4-inch base
1	3,154	2.00	9,042.00		0	0	0	0	
8	7,208	2.00	18,132.00			.022		.055	
5	2,304	3.50	8,063.00						
5	20,436	1.50							
6	6,032	1.50	9,048.00						
5	4,500		4,911.00		0	0	0	0	Private cost.
5	2,435	1.94	5,905.00		0	0	0	0	
7	2,645	1.63	4,713.00		0	0	0	0	
5	1,906	1.94	6,767.00		0	0	0	0	
5	3,000		15,184.00		0	0	0	0	
5	2,402	1.94	2,288.00						In place of coal tar. Widening.
9	6,428	1.76	9,793.00						
5	3,042	.57½	6,788.00						
7	8,733	.86	24,790.00						
5	6,314	.77½							
2	13,109	.99½							
	5,000								Do.
	2,380				0	0	0	0	
	5,000				0	0	0	0	
	2,000		4,218.00		0	.004		0	
9	1,662	2.00	10,809.00		0	.034		.08	
7	3,802	1.98	29,373.00	1879	.75		.042	.009	In place of coal tar. Widening.
2	9,179	3.20	3,893.00						
4	1,364	2.18	8,045.00	1884	1.56	.014	.047	.0053	
1	1,281		40,267.00	1878	.60	.017			
2	2,514	3.20		1886	.315				
2	12,583	3.20		1890					
5	1,565	2.19	3,715.00						Do.
0	1,147								
	10,275	3.20	32,882.00	1878	1.40		.023		
2				1882			.039		
3	9,511	3.50		1892			.014	.0012	
0	2,308	2.00	33,288.00	1899					
			7,420.00			.017		.004	In place of coal tar.
2	4,178	1.77	12,006.72						
3	2,100	.23	2,966.00						
1	1,768	.96	3,212.00						
7	562	1.63			0	0	0	0	
4	5,300								
1	1,730	2.00	8,085.00						In place of coal tar.
3	3,737	1.05	11,399.00						
1	6,517		18,690.00						
4	2,476		5,545.00		0	0	0	0	
1	5,933	3.20	18,986.00	1881	1.46		.015	0	

TABLE D.—*Descriptive list of street pavements and suburban roadways.*

Street.	From—	To—	Kind of pavement or roadway.
G. SW .....	Eighth .....	Water .....	Capital .....
Gales .....	Fifteenth .....	Seventeenth .....	Asphalt block .....
Good Hope road .....	.....	.....	Macadam .....
Grace .....	Thirty-second .....	Thirty-third .....	Cobble .....
Grant avenue .....	Brightwood avenue .....	Florida avenue .....	Macadam .....
Grant .....	Sixteenth .....	Eighteenth .....	do .....
Grant place .....	G and H, NW .....	Ninth and Tenth .....	Asphalt, H. B. .....
Grant road .....	.....	.....	Gravel .....
Grant (Pleasant) .....	Nichols avenue .....	Fillmore .....	do .....
H, NW .....	North Capitol .....	First .....	Asphalt, H. B. .....
Do. ....	First .....	Fourth .....	Granite .....
Do. ....	Fourth .....	Seventh .....	Coal tar .....
Do. ....	Seventh .....	Thirteenth .....	do .....
Do. ....	Thirteenth .....	Fourteenth .....	do .....
Do. ....	Fourteenth .....	Fifteenth .....	Asphalt, H. B. .....
Do. ....	Fifteenth .....	Vermont avenue .....	do .....
Do. ....	Vermont avenue .....	Connecticut avenue .....	Asphalt .....
Do. ....	Connecticut avenue .....	Pennsylvania avenue .....	Asphalt, H. B. .....
Do. ....	Pennsylvania avenue .....	Twenty-second .....	Coal tar .....
Do. ....	Twenty-second .....	Twenty-third .....	Asphalt, H. B. .....
Do. ....	Twenty-third .....	Twenty-fifth .....	Cobble .....
H. NE. ....	North Capitol .....	First .....	Asphalt, H. B. .....
H. NE. (north side) .....	First .....	Fifteenth .....	do .....
H. NE. (south side) .....	do .....	do .....	Asphalt, B. B. .....
H. SW .....	One-half .....	First .....	Macadam .....
H. SE. ....	First .....	Second .....	Gravel .....
H. SW .....	do .....	Third .....	Asphalt, B. B. .....
Do. ....	Third .....	Four-and-a-half .....	Asphalt, H. B. .....
Do. ....	Four-and-a-half .....	Seventh .....	do .....
Do. ....	Seventh .....	Ninth .....	do .....
Do. ....	Ninth .....	Water .....	Granite .....
Harewood road .....	.....	.....	Gravel .....
Harrison .....	Navy-yard bridge eastward. Extended to Minnesota avenue.		Vitrified block .....
Do. ....			Asphalt, H. B. .....
Do. ....			do .....
Hartford .....	Tenth .....	Thirteenth .....	Gravel .....
Harvard .....	Brightwood avenue .....	do .....	do .....
Do. ....	Thirteenth .....	Fourteenth .....	Asphalt block .....
High .....	Maple .....	Arthur .....	Gravel .....
Heckman, SE .....	First and Second .....	E and F .....	Asphalt block .....
Hillyer .....	Q and R .....	Twentieth and Twenty-first .....	do .....
Holmead .....	Whitney avenue .....	Spring road .....	Gravel .....
Hopkins .....	O and P .....	Twentieth and Twenty-first .....	Asphalt .....
Howard .....	Brightwood avenue .....	Sixth .....	Macadam .....
Do. ....	Fourteenth .....	Seventeenth .....	do .....
Do. ....	Eighteenth .....	500 feet west .....	do .....
Huntington place .....	Fourteenth .....	University place .....	Asphalt block .....
I, NW .....	North Capitol .....	New Jersey avenue .....	Coal tar .....
Do. ....	Second .....	Fifth .....	Asphalt, H. B. .....
Do. ....	Fifth .....	Eighth .....	do .....
Do. ....	Eighth .....	Ninth .....	do .....
Do. ....	Ninth .....	Tenth .....	do .....
Do. ....	Tenth .....	Eleventh .....	do .....
Do. ....	Eleventh .....	Thirteenth .....	Coal tar .....
Do. ....	Thirteenth .....	Fifteenth .....	Asphalt, H. B. .....
Do. ....	Fifteenth .....	Seventeenth .....	Coal tar .....
Do. ....	Seventeenth .....	Eighteenth .....	Asphalt, H. B. .....
Do. ....	Eighteenth .....	Pennsylvania avenue .....	do .....
Do. ....	Pennsylvania avenue .....	Twenty-third .....	Asphalt .....
Do. ....	Twenty-third .....	New Hampshire avenue .....	Asphalt, H. B. .....

with repairs to asphalt pavements to July 1, 1902—Continued.

Year laid.	Square yards.	Price per square yard.	Original cost.	Resurfaced.		Repairs—average annual cost per square yard.			Remarks.
				Year.	Cost per square yard.	Prior to resurfacing.	Since resurfacing.	Current year.	
1901	4,877	7.600							Resurfaced, New Hampshire ave. to Twenty-fourth.
1890	5,288		\$13,997.00			\$0.002		\$0.002	
1877	2,665	\$1.78	4,744.00						
1877	23,890	2.18	51,115.00	1887		.002			
1877	23,890	2.18	51,115.00	1889			\$0.005		
1893	2,645	2.27	6,017.00	1891			.02		
				1897			.045	.033	
				1878	\$1.96		.015		
1873	1,628	3.20	5,210.00	1888	.58		.035	.006	
				1902					
1893	8,141	2.26	18,602.00			.043		.038	
1884	483	2.25	1,089.00			.04		.27	
1889	1,179	2.00	2,358.00		0	0	0	0	
1890	1,500								
1901	6,000								
	2,300								Resurfaced Seventh to Ninth.
1897	6,030		2,700.00						
	7,000								
1889	4,322		4,681.01						
	3,625								
1895	3,400								
	1,708	1.93	3,817.00		0	0	0	0	
	8,000								
	30,000								
	10,600								
1900	2,702				0	0	0	0	
1900	384								
1872	784	3.25	2,548.00						
1879	1,137	1.91	2,274.00						
1872	4,765	3.25	15,468.00						
1901	1,850								Resurfaced Seventh to Ninth.
	3,600								
1894	3,067	2.18	7,265.00		0	0	0	0	
1890	2,597	2.00	6,711.00			.0013		0	
1880	5,564	1.85	15,158.00			.012		.0321	
1879	13,147	1.75	32,190.00	1895	.38		.035	.011	
				1900		.04		.04	
1881	4,573	2.08	9,788.00	1902	0	.02		.06	
1873	5,851	3.20	18,723.00	1878	1.49				
1879	6,084	1.47	9,143.00	1895		.023	.012	.0147	
1882	9,171	2.26	2,188.00			.03		.007	
						.02		.044	
1895	500			1895	2.36				
1877	1,138	2.67	3,039.00	1897	1.36	.04		0	
1875	7,897	3.70	31,906.00	1888	.693	.15		.054	
1897	762	1.63	1,250.00		0	0	.003	.054	
1898	778	1.55	1,803.00		0	0	0	0	
1898	3,581	1.57	8,796.00		0	0	0	0	
1897	4,476	1.63	10,824.00		0	0	0	0	
1894	5,486	2.10	15,445.00		0	0	0	0	
1896	7,183	1.63	16,788.00		0	0	0	0	
1895	3,449	.49	2,696.00						
1876	5,724	.70	4,007.00						
1876	6,973	1.50	10,460.00						
	8,454								
1876	9,177	1.05	9,636.00						
1891	1,125		4,120.00						

TABLE D.—*Descriptive list of street pavements and suburban roadways.*

Street.	From—	To—	Kind of pavement or roadway.
M. & N.	Four-and-a-half.	Water.	Granite.
Maryland	P and Q	Fifteenth and Seventeenth	Coal tar.
Do.	do.	Seventeenth and Eighteenth.	Asphalt, H. B.
Do.	M and N	Sixth and Seventh.	do.
M. & N. avenue	N and O	Third and Four-and-a-half.	Asphalt block.
Maryland	Obsolete.	Oak.	Gravel.
Maryland	B & O. R. R.	District line.	do.
Maryland Dr. & Park	Florida avenue.	Second.	Asphalt, H. B.
Do.	Second.	Fourth.	Asphalt, H. B.
Maryland	Florida.	High.	Gravel.
Maryland	Third.	Sixth.	Cobble.
Maryland	P and Q	Sixth and Seventh.	Asphalt, H. B.
Maryland avenue NE	First.	Fourth.	Asphalt, H. B.
Do.	Sixth.	Eleventh.	do.
Do.	Eleventh.	Thirteenth.	do.
Do.	Thirteenth.	Fifteenth.	do.
Do.	Intersection.	Fifteenth.	Asphalt, H. B.
Maryland avenue SW	First.	Third.	do.
Do.	Third.	Four-and-a-half.	Asphalt.
Do.	Four-and-a-half.	Seventh.	Cobble.
Do.	Third.	do.	Rubbl.
Do.	Seventh.	Fourteenth.	Belgian.
Massachusetts avenue	North Capitol.	New Jersey avenue.	Coal tar.
SW	New Jersey avenue.	Third.	Asphalt, H. B.
Massachusetts avenue	Fourth.	Seventh.	do.
SW north side.	do.	do.	do.
Massachusetts avenue	do.	do.	do.
NW north side.	Intersection Fourth.	do.	do.
Massachusetts avenue	do.	Intersection Fifth.	do.
Do.	Ninth.	Thirteenth.	do.
Do.	Thirteenth.	Fourteenth.	Asphalt, H. B.
Do.	Fourteenth.	Twentieth.	Coal tar.
Do.	Highland Terrace.	Fourteenth to Fifteenth.	do.
Triangular reservation east of Twentieth street.	do.	do.	do.
Massachusetts avenue	Twentieth.	Florida avenue.	do.
NW	Florida avenue.	Sheridan circle.	Asphalt, H. B.
Do.	Florida avenue.	Sheridan circle.	Asphalt, H. B.
Sheridan circle.	Circle.	Belmont.	Macadam.
Massachusetts avenue	Circle.	Belmont.	Macadam.
NW	Circle.	Belmont.	Macadam.
Massachusetts avenue	North Capitol.	First.	Asphalt, H. B.
NE	North Capitol.	First.	Asphalt, H. B.
Do.	First.	Second.	Asphalt block.
Do.	Second.	Fourth.	Asphalt, H. B.
Do.	do.	do.	do.
Do.	do.	do.	do.
Do.	Sixth.	Eighth.	Asphalt block.
Do.	Eighth.	Eleventh.	do.
Michigan avenue	North Capitol.	Lincoln avenue.	Macadam.
Military road.	do.	do.	do.
Do.	do.	do.	do.
Milwaukee	do.	do.	Gravel.
Minneota avenue.	Harrison.	Pennsylvania avenue.	do.
Missouri avenue.	Third.	Four-and-a-half.	Granite.
Do.	Four-and-a-half.	Sixth.	Asphalt block.
Morgan	M and N	New Jersey avenue and Kirby.	Asphalt, H. B.
Do.	Lydecker.	Spring road.	Gravel.
Morris place.	F and G, NE	Sixth and Seventh.	Asphalt block.
Murdock Mill road.	do.	do.	Gravel.
Myrtle	I and K	North Capitol and First.	Asphalt, H. B.

repairs to asphalt pavements to July 1, 1902—Continued.

r l.	Square yards.	Price per square yard.	Original cost.	Resurfaced.		Repairs—average an- nual cost per square yard.			Remarks.
				Year.	Cost per square yard.	Prior to re- surfacing.	Since resurfacing.	Cur- rent year.	
8	3,136	\$1.54	\$7,064.00	-----	0	0	0	0	
9	3,294	2.00	8,800.00	-----	0	0	0	\$0.008	
	2,200			-----					
	7,000			-----					
0	3,867		4,068.00	-----					
2	1,292	.95	2,204.00	-----					
1	4,249	.93	6,796.00	-----					
3	3,214	1.63	9,352.00	-----	0	0	0	0	
	3,100			-----					
1	1,424			-----					
2	3,530			-----					4-inch base.
3	4,850	1.77	10,493.00	-----					
	2,600			-----					
0	8,400			-----					
3	1,251	2.00	2,725.00	-----	0	0	0	0	
3	6,493			-----					
7	8,529	2.00	23,824.00	-----	0	\$0.007		0.015	
1	9,038	2.00	33,149.00	-----					
1	4,054	1.85	6,890.00	-----	0	.015		.017	
7	205			-----					
	3,800			-----					Permit work.
	7,500			-----					
	1,400			-----					
4	2,839	.70	1,987.00	-----					
	7,500			-----					
4	1,393			-----					
9	1,446		3,887.00	-----	0	0	0	0	
9	850			-----					
2			18,778.10	-----					
9	4,537	1.76	9,859.00	-----	0	0	0	0	
4	3,984		7,130.00	-----	0	0	0	0	Rubble base.
4	8,384	3.20	26,829.00	-----	1878 1880 1894	\$1.65 .487 .90	\$0.015 .034	.023	
3	1,800	8.20		-----					
5	2,000			-----					
5	27,551	3.00	82,654.00	-----	1889 1892 1895 1898	.06 .74 .557 .19	.007 .025	.0048	
0	11,671	1.83	21,358.00	-----			.014	.027	
4	7,521	3.50		-----					
4	4,906	2.50	38,818.00	-----					
3	18,021		63,075.00	-----					
5	4,498	2.00	13,513.00	-----	0	0	0	0	
9	15,000			-----					
	1,475			-----					
1	6,000			-----					
	3,500			-----					
	2,760			-----					
4	1,708		5,654.00	-----					
0	7,931	.57	11,923.00	-----					
0	2,313	1.77	4,501.00	-----					
	4,600			-----	0	0	0	0	
0	3,500			-----					
1	10,409			-----					
0	2,548	1.77	5,125.00	-----					
1	11,185			-----					
	8,755			-----					
0	2,984	1.76	5,254.00	-----	0	0	0	0	
9	1,699		4,579.00	-----		.003		.134	

TABLE D.—*Descriptive list of street pavements and suburban roadways.*

Street.	From—	To—	Kind of pavement or roadway.
Klingle road .....	Linnean Hill road to Rock Creek.		Macadam .....
Do. ....	Rock Creek .....	Woodley road .....	Gravel .....
L, NW .....	North Capitol .....	New Jersey avenue .....	Asphalt, B. B. ....
Do. ....	Fourth .....	Fifth .....	Granite .....
Do. ....	New Jersey avenue .....	Fourth .....	Coal tar .....
Do. ....	Fifth .....	Sixth .....	do. ....
Do. ....	Eighth .....	Seventeenth .....	do. ....
Do. ....	Connecticut avenue .....	Twentieth .....	do. ....
Do. ....	Sixth .....	Eighth .....	Asphalt, H. B. ....
Do. ....	Seventeenth .....	Connecticut avenue .....	Coal tar .....
Do. ....	Twentieth .....	Twenty-fifth .....	Asphalt, H. B. ....
Do. ....	Pennsylvania avenue .....	Twenty-sixth .....	do. ....
Do. ....	Twenty-sixth .....	Twenty-seventh .....	Asphalt, B. B. ....
L, NE .....	North Capitol .....	Eighth .....	Macadam .....
L, SE .....	South Capitol .....	Second .....	do. ....
Do. ....	Second .....	Fourth .....	Gravel .....
Do. ....	Fourth .....	Eighth .....	do. ....
L, SW .....	South Capitol .....	Four-and-a-half .....	do. ....
Do. ....	Four-and-a-half .....	Water .....	Macadam .....
Lansing .....	Tenth .....	Thirteenth .....	Gravel .....
Lamar .....	Connecticut avenue .....	Phelps place .....	do. ....
Leroy place .....	Connecticut avenue .....	Phelps place .....	Asphalt, H. B. ....
Linnean Mill road .....	Connecticut avenue .....	Phelps place .....	Gravel .....
Lincoln avenue .....	Connecticut avenue .....	Phelps place .....	do. ....
Loughboro road .....	Connecticut avenue .....	Phelps place .....	do. ....
Louisiana avenue .....	Intersection C and Seventh.		Asphalt, B. B. ....
Do. ....	Intersection C and Seventh.		Vitrified block .....
Do. ....	Front of Opera House.		Granite .....
Do. ....	Eighth .....	Ninth .....	do. ....
Do. ....	Ninth .....	Tenth .....	do. ....
Lowell .....	Sixteenth .....	Eighteenth .....	Macadam .....
Lydecker .....	Whitney avenue .....	Fourteenth .....	Gravel .....
M, NW .....	North Capitol .....	First .....	Asphalt, H. B. ....
Do. ....	First .....	New Jersey avenue .....	Asphalt, B. B. ....
Do. ....	New Jersey avenue .....	Sixth .....	Asphalt, H. B. ....
Do. ....	Sixth .....	Fourteenth .....	do. ....
Do. ....	Fourteenth .....	Sixteenth .....	do. ....
Do. ....	Sixteenth .....	Eighteenth .....	Coal tar .....
Do. ....	Eighteenth .....	New Hampshire avenue .....	Asphalt, H. B. ....
Do. ....	Twenty-first .....	Twenty-sixth .....	do. ....
Do. ....	Twenty-sixth .....	Rock Creek .....	do. ....
Do. ....	Rock Creek .....	Twenty-eighth .....	Coal tar .....
Do. ....	Twenty-eighth .....	Thirty-first .....	do. ....
M, NW (S. side) .....	Thirty-first .....	Thirty-second .....	Asphalt, H. B. ....
M, NW (N. side) .....	do. ....	do. ....	do. ....
M, NW .....	Thirty-second .....	Thirty-third .....	do. ....
Do. ....	Thirty-third .....	Thirty-sixth .....	do. ....
M, NE .....	North Capitol .....	Second .....	do. ....
Do. ....	Second .....	Florida avenue .....	do. ....
Do. ....	Twelfth .....	Trinidad avenue .....	Macadam .....
M, SE .....	South Capitol .....	New Jersey avenue .....	Cobble .....
Do. ....	New Jersey avenue .....	Fourth .....	Rubble .....
Do. ....	Fourth .....	Ninth .....	Cobble .....
M, SW .....	South Capitol .....	Four-and-a-half .....	Rubble .....
Do. ....	Four-and-a-half .....	Sixth .....	Granite .....

OPERATIONS OF THE ENGINEER DEPARTMENT, D. C. 21

repairs to asphalt pavements to July 1, 1902—Continued.

No.	Square yards.	Price per square yard.	Original cost.	Resurfaced.		Repairs—average annual cost per square yard.			Remarks.
				Year.	Cost per square yard.	Prior to resurfacing.	Since resurfacing.	Current year.	
11	4,877								
10	7,600								
7	5,288		\$13,997.00			\$0.002		\$0.022	
7	2,665	\$1.78	4,744.00						
7	23,890	2.18	51,115.00	1887		.002			
7	23,890	2.18	51,115.00	1889			\$0.005		
3	2,645	2.27	6,017.00	1891			.02		
3	1,628	3.20	5,210.00	1897			.045	.038	
3	1,628	3.20	5,210.00	1878	\$1.96	.038	.015	.006	Resurfaced, New Hampshire ave. to Twenty-fourth.
3	1,628	3.20	5,210.00	1888	.58		.035		
3	1,628	3.20	5,210.00	1902					
53	8,141	2.26	18,602.00			.043		.038	
4	483	2.25	1,089.00			.04		.237	
9	1,179	2.00	2,358.00		0	0	0	0	
9	1,500								
11	6,000								
11	2,300								
11	6,030		2,700.00						
11	7,000								
11	4,332		4,681.01						
11	3,625								
15	3,400								
15	1,708	1.93	3,817.00		0	0	0	0	
15	8,000								
15	30,000								
15	10,600								
10	2,702				0	0	0	0	
10	384								
12	784	3.25	2,548.00						
12	1,137	1.91	2,274.00						
12	4,785	3.25	15,468.00						
11	1,850								
11	3,600								
14	3,067	2.184	7,265.00		0	0	0	0	
10	2,597	2.00	6,711.00			.0013		0	
10	5,564	1.85	15,158.00			.012		.0321	
19	13,147	1.75	32,199.00	1895	.38		.035	.011	
19	13,147	1.75	32,199.00	1900		.04		.04	Resurfaced Seventh to Ninth.
11	4,573	2.08	9,788.00	1902	0	.02		.06	
13	5,851	3.20	18,723.00	1878	1.49				
13	5,851	3.20	18,723.00	1895		.026	.012	.0147	
19	6,084	1.47	9,143.00			.03		.007	
12	9,171	2.26	2,184.00			.02		.044	
15	500			1895	2.36				
15	1,138	2.67	3,039.00	1897	1.36	.04		0	
15	7,887	3.70	31,966.00	1888	.693	.15	.033	.054	
17	762	1.63	1,226.00			0	0	0	
18	778	1.55	1,803.00			0	0	0	
18	3,581	1.574	8,736.00		0	0	0	0	
17	4,476	1.63	10,824.00		0	0	0	0	
14	5,486	2.10	15,445.00		0	0	0	0	
16	7,183	1.63	16,788.00		0	0	0	0	
16	3,449	.491	2,696.00						
16	5,724	.70	4,007.00						
16	6,973	1.50	10,460.00						
16	8,454								
16	9,177	1.06	9,636.00						
11	1,125		4,120.00						

TABLE D.—*Descriptive list of street pavements and suburban roadways.*

Street.	From—	To—	Kind of pavement or roadway.
M. SW .....	Four-and-a-half .....	Water .....	Granite.
Madison .....	P and Q .....	Fifteenth and Seventeenth .....	Coal tar
Do .....	do .....	Seventeenth and Eighteenth .....	Asphalt, B. B.
Do .....	M and N .....	Sixth and Seventh .....	do .....
McLean avenue .....	N and O .....	Third and Four-and-a-half .....	Asphalt block
Magnolia .....	Chestnut .....	Oak .....	Gravel.
Maple (Takoma) .....	B. & O. R. R. .....	District line .....	do .....
Maple (Le Droit Park) .....	Florida avenue .....	Second .....	Asphalt, B. B.
Do .....	Second .....	Fourth .....	Asphalt, H. B.
Maple (Anacostia) .....	Pleasant .....	High .....	Gravel.
Maine avenue .....	Third .....	Sixth .....	Cobble.
Marion .....	P and Q .....	Sixth and Seventh .....	Asphalt, B. B.
Maryland avenue NE .....	First .....	Fourth .....	Asphalt block
Do .....	Sixth .....	Eleventh .....	do .....
Do .....	Eleventh .....	Thirteenth .....	do .....
Do .....	Thirteenth .....	Fifteenth .....	do .....
Do .....	Intersection .....	Fifteenth .....	Asphalt, H. B.
Maryland avenue SW .....	First .....	Third .....	do .....
Do .....	Third .....	Four-and-a-half .....	Asphalt.
Do .....	Four-and-a-half .....	Seventh .....	Cobble.
Do .....	Third .....	do .....	Rubble .....
Do .....	Seventh .....	Fourteenth .....	Belgian .....
Massachusetts avenue .....	North Capitol .....	New Jersey avenue .....	Coal tar
NW .....	New Jersey avenue .....	Third .....	Asphalt, H. B.
Do .....	Fourth .....	Seventh .....	do .....
Massachusetts avenue .....	do .....	do .....	do .....
NW (north side) .....	do .....	do .....	do .....
Massachusetts avenue .....	Intersection Fourth .....	do .....	do .....
NW .....	Intersection Fifth .....	do .....	do .....
Do .....	Ninth .....	Thirteenth .....	do .....
Do .....	Thirteenth .....	Fourteenth .....	Asphalt, B. B.
Do .....	Fourteenth .....	Twentieth .....	Coal tar
Do .....	Highland Terrace, Fourteenth to Fifteenth .....	do .....	do .....
Triangular reservation east of Twentieth street .....	do .....	do .....	do .....
Massachusetts avenue .....	Twentieth .....	Florida avenue .....	do .....
NW .....	Florida avenue .....	Sheridan circle .....	Asphalt, H. B.
Do .....	do .....	do .....	do .....
Sheridan circle .....	Circle .....	Belmont .....	Macadam.
Massachusetts avenue .....	Circle .....	Belmont .....	do .....
NW .....	North Capitol .....	First .....	Asphalt, H. B.
Massachusetts avenue .....	North Capitol .....	First .....	Asphalt, H. B.
NE .....	First .....	Second .....	Asphalt block
Do .....	Second .....	Fourth .....	Asphalt, H. B.
Do .....	do .....	do .....	do .....
Do .....	Sixth .....	Eighth .....	Asphalt block
Do .....	Eighth .....	Eleventh .....	do .....
Michigan avenue .....	North Capitol .....	Lincoln avenue .....	Macadam.
Military road .....	do .....	do .....	do .....
Do .....	do .....	do .....	do .....
Milwaukee .....	do .....	do .....	Gravel.
Minnesota avenue .....	Harrison .....	Pennsylvania avenue .....	do .....
Missouri avenue .....	Third .....	Four-and-a-half .....	Granite.
Do .....	Four-and-a-half .....	Sixth .....	Asphalt block
Morgan .....	M and N .....	New Jersey avenue and Kirby .....	Asphalt, H. B.
Do .....	Lydecker .....	Spring road .....	Gravel.
Morris place .....	F and G, NE .....	Sixth and Seventh .....	Asphalt block
Murdock Mill road .....	do .....	do .....	Gravel.
Myrtle .....	I and K .....	North Capitol and First .....	Asphalt, B. B.

repairs to asphalt pavements to July 1, 1902—Continued.

Square yards.	Price per square yard.	Original cost.	Resurfaced.		Repairs—average annual cost per square yard.			Remarks.
			Year.	Cost per square yard.	Prior to resurfacing.	Since resurfacing.	Current year.	
757		\$2,763.00						
2,674	\$3.00	8,022.00			\$0.032		\$0.118	
2,271	2.00	7,122.00			.012		.026	
1,538					.009		.022	
2,127	2.00	4,619.00						
4,000								
2,500								
3,237	2.00			0	0	0	0	
3,680	2.25	11,486.00			.001		0	
3,000								
4,634	.70	3,244.00						
2,861	2.00	7,706.00			.002		.021	
11,535	2.00	20,945.00						
14,051	2.00	30,634.00						
8,209	2.00	22,966.00						
9,635	2.00	24,840.00						
2,390				0	0	0	0	
3,394	2.29	7,801.00			.02	0	.145	
3,213	1.72	7,793.39						In place of cobble.
5,537								
4,050	1.75	7,113.00						
29,299	3.50	95,046.00						
5,143	1.98	14,179.00			.045		.007	
3,858	2.26	8,834.00	1891	\$1.43	.035	\$0.044	.045	
3,910	1.83	7,349.00	1889	.309	.003	.008	.02	
3,108	2.29	7,112.00			.057		.118	
742	1.95	1,447.00			.024	0	.003	
498	1.95	971.00	1890		.057	0	0	
9,920	1.47	14,749.00			.012		.019	
2,001	2.18	6,530.00	1884	1.43	.015	0.56	.0199	
13,898	3.20	44,474.00	1892	.17	.015	.043	.014	
1,248	3.20	3,995.00	1895	.68	.045	.135	.016	
2,646	3.20	8,468.00			.025		0	
5,817	3.00	17,453.00			.019		.021	
2,572	1.57	4,094.00		0	0	0	0	
5,156	1.78	12,023.00		0	0	0	0	
12,250				0	0	0	0	
4,009	2.25	12,102.00			.008		0	
3,961	2.00	11,684.00						
5,223	1.68	11,121.00		0	0	0	0	
419	2.19	1,025.00		0	0	0	0	
6,749	2.00	16,444.00						
6,308	1.84	13,977.00						
12,816								
6,400								
10,000								
8,000								
21,226								
2,562		6,290.00						
1,371	2.00	4,589.00						
1,307	2.25	4,472.00		0	0	0	0	
3,200								
1,644	1.77	3,304.00						
10,000								
1,426	2.00	4,896.00			.009		0	

TABLE D.—*Descriptive list of street pavements and suburban roadways*

Street.	From—	To—	Kind of pavement or roadway.
North Capitol	E	Massachusetts avenue	Coal tar
Do.	Massachusetts avenue	I	Asphalt
Do.	I	K	do
Do.	K	M	Asphalt, H. B.
Do.	M	New York avenue	do
Do.	New York avenue	O	do
Do.	O	Q	do
North Capitol (west side).	P	Florida avenue	do
Do.	Florida avenue	R	do
Do.	R	T	Macadam
Nichols avenue			Granite
Do.			do
Do.			Gravel
North Carolina avenue SE.	First	Second	Asphalt block
Do.	Third	Sixth	do
Do.	Sixth	Eighth	do
Do.	Eighth	Eleventh	do
O. NW	North Capitol	First	Asphalt
Do.	First	Third	Asphalt, H. B.
Do.	do	do	do
Do.	New Jersey avenue	Vermont avenue	Coal tar
Do.	Vermont avenue	Thirteenth	Asphalt, H. B.
Do.	Fifteenth	Sixteenth	Coal tar
Do.	Sixteenth	Seventeenth	Asphalt, H. B.
Do.	Twentieth	Twenty-first	Coal tar
Do.	Twenty-first	Twenty-second	Asphalt, B. B.
Do.	Twenty-eighth	Twenty-ninth	do
Do.	Twenty-ninth	Thirty-second	Asphalt, H. B.
Do.	Thirty-second	Thirty-fifth	Granite
Do.	Thirty-fifth	College gate	Coal tar
Oak	Brown	Center	Gravel
Do.	Carroll avenue	Magnolia	do
Ohio avenue	Twelfth	Fourteenth	Cobble
Do.	Fourteenth	Fifteenth	do
Olive	Twenty-eighth	Thirtieth	Asphalt block
Omaha	New Hampshire avenue	Fifth	Asphalt, B. B.
Do.	Bunker Hill road	Thirteenth	Gravel
Ontario	Superior	Columbia road	do
Oregon avenue	New Hampshire avenue	Eighteenth	Asphalt
P. NW	North Capitol	Fourth	Asphalt, B. B.
Do.	New Jersey avenue	Ninth	Asphalt, H. B.
Do.	Ninth	Fifteenth	do
Do.	Fifteenth	Eighteenth	do
Do.	Eighteenth	Twentieth	Coal tar
Do.	Twentieth	Twenty-second	Granite
Do.	Twenty-second	Rock Creek	Coal tar
Do.	Rock Creek	340' west	do
Do.	340' west of Rock Creek	Thirtieth	Granite
Do.	Thirtieth	Thirty-second	do
Do.	Thirty-second	Thirty-fifth	do
Do.	Thirty-fifth	Thirty-sixth	Asphalt, H. B.
P. NE	North Capitol	Florida avenue	do
P. SW	Four-and-a-half	Water	Granite
Park	Fourteenth	Seventeenth	Macadam
Park place	B and C, NE	Eleventh and Twelfth	Gravel
Patterson	M and N	North Capitol and First	do
Pennsylvania avenue	First	Seventh	Asphalt, H. B.
Do.	Seventh	Fifteenth	do
Do.	Intersections	First to Fifteenth	do
Do.	Fifteenth	Seventeenth	do

repairs to asphalt pavements to July 1, 1902—Continued.

Square yards.	Price per square yard.	Original cost.	Resurfaced.		Repairs—average annual cost per square yard.			Remarks.
			Year.	Cost per square yard.	Prior to resurfacing.	Since resurfacing.	Current year.	
6,000								
5,642	\$2.25	\$17,341.00			\$0.0007		0	
3,811	2.00	9,140.00			.0007		\$0.016	
4,454	2.28	10,160.00			.045		.048	
6,802	4.47	12,421.00	1894	\$0.119	.026	\$0.017	.015	
			1899	.517		.005		
3,249	1.84	6,236.00			.004		.017	
6,556	3.20	20,982.00	1878	1.24		.04		
			1894	.70		.29		
517	3.60	1,656.00	1898	1.177		.036	.019	
					.032			
2,081	2.00	6,361.00		0	0	0	0	4-inch base.
2,196	2.25	9,633.00		0	0	0	0	
1,015	1.77	2,541.00		0	0	0	0	On asphalt block.
1,599		2,597.00		0	0	0	0	
3,525	1.844	6,599.00			.013		.025	
5,689	1.844	10,760.00			.016		.015	
11,224	1.05	13,230.00						
	1.50							
5,970	.70	4,179.00						
2,619	1.80	5,770.00		0	0	0	0	
2,301	1.56	5,897.00		0	0	0	0	
13,000								
		4,466.02						
7,111								
1,400								
9,000								
7,967	1.50	11,951.00						
6,992	1.47	10,525.00			.015		.007	
10,047	2.25	22,988.00			.034		.043	
2,538	2.28	6,029.00			.011		.024	
4,164	2.00	11,036.00			.046		.114	
8,809	2.00	22,937.00			.003		.032	
6,805	2.00	22,073.00			.0015		.014	
5,082	2.00	10,163.00		0	0	0	0	Permit work
2,862	2.15	6,203.00	1888	.415	.018			
2,385	2.17	5,175.00	1892			.057	.023	
1,177	2.10	2,476.00				.077	.036	
21,462	2.26	49,653.00				.029	.035	
3,609	2.25	8,398.00				.033	.038	
18,127	1.994	38,358.00	1895	.415	.037	.067	.023	
8,776	1.87	16,881.00						
5,500								
3,300								
5,604	2.00	15,040.00			.006		.019	
9,229	2.00	25,723.00			.01		.049	
22,317	3.20	71,416.00					.000	This street is so changed by removing of center parking that it is practically a new pavement.
1,885								Removing center parking.
1,862	3.00	5,589.00	1895	1.61	.031	.056	0	
3,510	3.20	11,231.00	1878	1.54		.038	.054	
8,859								
5,383	2.25	16,807.58			.006	0		
2,790	2.25	6,755.00			.034		.076	
2,396		7,440.00						

TABLE D.—*Descriptive list of street pavements and suburban roadways.*

Street.	From—	To—	Kind of pavement or roadway.
Pennsylvania avenue .	Seventeenth	Eighteenth	Coal tar
Pennsylvania avenue (north side).	Eighteenth	Twenty-first	Asphalt, H. B.
Pennsylvania avenue .	Twenty-first	Twenty-third	Coal tar
Pennsylvania avenue (south side).	Eighteenth	do	do
Pennsylvania avenue (north side).	Twenty-third	Twenty-sixth	do
Pennsylvania avenue .	Twenty-sixth	Rock Creek	do
Pennsylvania avenue (south side).	Twenty-third	Twentieth-fourth	Asphalt, H. B.
Pennsylvania avenue .	Twenty-fourth	Twenty-sixth	do
Do.	Rock Creek	M	Coal tar
Pennsylvania avenue, SE (north side).	Second	Eighth	Asphalt, B. B.
Pennsylvania avenue (south side).	do	Fourth	Asphalt, H. B.
Do.	Fourth	Seventh	do
Pennsylvania avenue (north side).	Eighth	Eleventh	do
Pennsylvania avenue .	do	do	Asphalt, B. B.
Do.	Eleventh	Twelfth	Asphalt, H. B.
Pennsylvania avenue, SE.	Twelfth	Thirteenth	Asphalt
Pennsylvania avenue .	Thirteenth	Bridge	Macadam
Do.	Eastern Branch	Minnesota avenue	do
Do.	Minnesota avenue	Branch avenue	Gravel
Phelps place	Bancroft	California	Asphalt, H. B.
Philadelphia	Bunker Hill road	Thirteenth	Gravel
Pickford place	F	G	Asphalt block
Pierce	L and M	New Jersey avenue and North Capitol	Asphalt, B. B.
Pierce place	S and T	Fourteenth and Fifteenth	Coal tar
Do.	do	Fifteenth and Sixteenth	Asphalt
Piney Branch road			Gravel
Pleasant Drive			Macadam
Polk			Gravel
Pomeroy			do
Portner place	Brightwood avenue	East	Asphalt, B. B.
Potomac	U and V	Fourteenth and Fifteenth	Asphalt block
Do.	M	Prospect	Granite
Do.	do	do	do
Do.	Prospect	O	Asphalt, H. B.
Princeton	Thirteenth	Fourteenth	Asphalt block
Do.	Brightwood avenue	Thirteenth	Gravel
Providence	Ninth	Fourteenth	Macadam
Do.	East of Fourteenth.		do
Q. NW	Third	New Jersey avenue	Asphalt, B. B.
Do.	do	Florida avenue	Asphalt
Do.	New Jersey avenue	Fifth	Coal tar
Do.	Fifth	Sixth	Asphalt, B. B.
Do.	Sixth	Rhode Island avenue	Coal tar
Do.	Rhode Island avenue	Vermont avenue	Asphalt, H. B.
Do.	Fourteenth	Sixteenth	Coal tar
Do.	Sixteenth	Seventeenth	do
Do.	Seventeenth	Nineteenth	Asphalt, B. B.
Do.	Nineteenth	Twentieth	Coal tar
Do.	Twentieth	Twenty-first	do
Do.	Massachusetts avenue	Twenty-second	do
Do.	do	Twenty-first	do
Do.	Twenty-eighth	Thirtieth	Asphalt, B. B.
Do.	Thirtieth	Valley	Coal tar
Do.	Valley	Thirty-second	do
Do.	Thirty-second	Thirty-fifth	Asphalt, B. B.
Q. NE	Lincoln avenue	Eckington place	Asphalt, H. B.
Quarry road	Columbia road	Zoo Park	Macadam

repairs to asphalt pavements to July 1, 1901—Continued.

Square yards.	Price per square yard.	Original cost.	Resurfaced.		Repairs—average annual cost per square yard.			Remarks.
			Year.	Cost per square yard.	Prior to resurfacing.	Since resurfacing.	Current year.	
3,856	\$1.98	\$8,461.00			\$0.081		\$0.083	4-inch base.
7,457	2.00	18,896.00	1902		.023			
2,887	2.00	6,328.00	1902		.08		.024	
6,307	2.25	19,415.00	1899	\$0.408	0	0	.014	
2,309	2.25	5,491.00		0	0	0	0	
1,665	2.10	4,307.00					.0034	
2,535	1.67	4,854.00		0	0	0	0	
797	1.80	1,821.00		0	0	0	0	
3,222	1.78	6,773.00		0	0	0	0	
3,964		6,368.00						
2,990								Complete.
3,823								
25,000								
3,111	1.77	7,888.00						
5,038	2.00	12,451.00						
6,378	2.00	18,715.00						
6,480	2.00	18,186.00						
3,188	\$1.72	\$7,793.50						
3,028	1.78	6,184.00		0	0	0	0	
985	1.78			0	0	0	0	
13,861	3.20	43,714.00	{ 1881 1902 }	\$0.598	\$0.018	\$0.05	\$0.042	Resurfaced 9 to 10.
481	2.00	1,080.00			.063		.079	
1,663	3.00	4,988.00			.007		.03	
1,697	2.29	3,886.00			.052		.072	
2,011	1.97	5,131.00			.007		.0057	
2,398	2.00	1,968.00			0		.0025	
880	2.00	2,328.00		0	0	0	0	
4,829	2.25	11,426.00			.044		.084	
4,435	1.98	8,744.00						
2,368	2.00	8,279.00			.018		.084	
1,000								
1,525								
6,527	.70	4,570.00						
2,642	.70	1,850.00						
1,674	1.77	3,894.00						
3,536	2.00	7,072.00		0	0	0	0	
3,000								
4,875								
2,129	1.65	5,297.80						
7,938	2.00	23,995.00		0	0	0	0	
5,168	2.25	12,397.00	1902		.081		0	
8,156	2.29	19,008.00			.057		.084	
8,076	2.25	18,221.00	1901		.043		.025	
1,569	3.20	5,021.00	{ 1878 1896 }	1.01 .656		.030 .047	0	
3,481	2.15	7,397.00						
1,078	3.20	3,452.00	{ 1881 1897 1887 }	1.30 1.82 1.314	.012	.108	.01	
1,560	3.20	5,088.00				.030	.018	
6,869	2.15	14,498.00						
4,011	1.95	7,969.00						
3,624	.85	4,655.00						
938	1.78	2,721.00		0	0	0	0	Laid on old base.
2,539	1.63	7,224.00		0	0	0	0	
2,000								
6,000								
1,700								
2,700								
28,486	1.184		1900	.099		.013	.015	
32,974	1.184							
16,061								
11,497			1900	.68	0	0	0	

TABLE D.—*Descriptive list of street pavements and suburban roadways.*

Street.	From—	To—	Kind of pavement or roadway.
Pennsylvania avenue	Seventeenth	Eighteenth	Coal tar
Pennsylvania avenue (north side).	Eighteenth	Twenty-first	Asphalt, H. B.
Pennsylvania avenue	Twenty-first	Twenty-third	Coal tar
Pennsylvania avenue (south side).	Eighteenth	do	do
Pennsylvania avenue (north side).	Twenty-third	Twenty-sixth	do
Pennsylvania avenue	Twenty-sixth	Rock Creek	do
Pennsylvania avenue (south side).	Twenty-third	Twentieth-fourth	Asphalt, H. B.
Pennsylvania avenue	Twenty-fourth	Twenty-sixth	do
Do	Rock Creek	M	Coal tar
Pennsylvania avenue, SE (north side).	Second	Eighth	Asphalt, B. B.
Pennsylvania avenue (south side).	do	Fourth	Asphalt, H. B.
Do	Fourth	Seventh	do
Pennsylvania avenue (north side).	Eighth	Eleventh	do
Pennsylvania avenue	do	do	Asphalt, B. B.
Do	Eleventh	Twelfth	Asphalt, H. B.
Pennsylvania avenue, SE.	Twelfth	Thirteenth	Asphalt
Pennsylvania avenue	Thirteenth	Bridge	Macadam
Do	Eastern Branch	Minnesota avenue	do
Do	Minnesota avenue	Branch avenue	Gravel
Phelps place	Bancroft	California	Asphalt, H. B.
Philadelphia	Bunker Hill road	Thirteenth	Gravel
Pickford place	F	G	Asphalt block
Pierce	L and M	New Jersey avenue and North Capitol	Asphalt, B. B.
Pierce place	S and T	Fourteenth and Fifteenth	Coal tar
Do	do	Fifteenth and Sixteenth	Asphalt
Piney Branch road			Gravel
Pleasant Drive			Macadam
Polk			Gravel
Pomeroy			do
Portner place	Brightwood avenue	East	Asphalt, B. B.
Potomac	U and V	Fourteenth and Fifteenth	Asphalt block
Do	M	Prospect	Granite
Do	do	do	do
Do	Prospect	O	Asphalt, H. B.
Princeton	Thirteenth	Fourteenth	Asphalt block
Do	Brightwood avenue	Thirteenth	Gravel
Providence	Ninth	Fourteenth	Macadam
Do	East of Fourteenth		do
Q. NW	Third	New Jersey avenue	Asphalt, B. B.
Do	do	Florida avenue	Asphalt
Do	New Jersey avenue	Fifth	Coal tar
Do	Fifth	Sixth	Asphalt, B. B.
Do	Sixth	Rhode Island avenue	Coal tar
Do	Rhode Island avenue	Vermont avenue	Asphalt, H. B.
Do	Fourteenth	Sixteenth	Coal tar
Do	Sixteenth	Seventeenth	do
Do	Seventeenth	Nineteenth	Asphalt, B. B.
Do	Nineteenth	Twentieth	Coal tar
Do	Twentieth	Twenty-first	do
Do	Massachusetts avenue	Twenty-second	do
Do	do	Twenty-first	do
Do	Twenty-eighth	Thirtieth	Asphalt, B. B.
Do	Thirtieth	Valley	Coal tar
Do	Valley	Thirty-second	do
Do	Thirty-second	Thirty-fifth	Asphalt, B. B.
Q. NE	Lincoln avenue	Eckington place	Asphalt, H. B.
Quarry road	Columbia road	Zoo Park	Macadam

repairs to asphalt pavements to July 1, 1901—Continued.

Square yards.	Price per square yard.	Original cost.	Resurfaced.		Repairs—average annual cost per square yard.			Remarks.
			Year.	Cost per square yard.	Prior to resurfacing.	Since resurfacing.	Current year.	
5,520	\$3.26					\$0.106	\$0.046	Laid on old base.
5,884	2.18	\$16,252.00		0	0	0	0	
9,423	3.20		1886	\$0.20	\$0.02	.058		
10,078	3.20	37,290.00	1888	.55		.023		
			1893	.13		.019	.020	
7,383	2.67	19,713.00	1888	.364	.014		.03	
			1894	.828		.045	.024	
1,225	1.84	2,289.00			.053		.086	
4,145	2.25	9,405.00			.033		.03	
1,837								
14,755	3.00	44,266.00	1882	1.45	.004	.022	.0108	
4,458	1.47	6,554.00			.005		.032	
6,128	1.47	9,115.00			.042		.0006	
5,329	2.33	12,781.00			.024		.035	
5,400	2.00	11,806.00			.008		.0118	
2,287	\$1.79	\$5,747.00		0	0	0	0	
2,349	1.72	4,582.02						
23,278	.55	28,707.00						
		2,898.81						
25,000								
1,164				0	0	0	0	
3,300								
2,120								
5,535	2.00	16,078.00			\$0.0005		\$0.0055	
2,154	3.20	6,903.00	1886	\$1.65	.033	\$0.045	0	
1,396	2.00	4,521.00		0	0	0	0	
4,000								
4,000								
1,400								
2,560	2.00	7,692.00			.005		.05	
1,025								
664		1,852.00						
389	1.93	788.00	1902					
1,840	2.25	4,332.00			.07		.07	
2,333	1.77	4,717.00						
6,300								
4,426								
		1,916.61						
1,812	2.00	6,518.00		0	0	0	0	
5,145	1.72	11,519.09						
2,031	2.00	4,870.00			.022		.058	
833	2.00	2,088.00			.009		0	
4,758	1.98	13,030.00	1896	.73	.054		.0054	
2,806	2.25	6,452.00	1900	1.126		.123	0	
4,806	3.20	15,378.00	1886	.705	.006	.005	.0022	
2,301	3.00	6,903.00	1892	.57		.013	.018	
4,904	2.00	10,744.00	1895	1.415	.027	.104		
			1902		.022		.007	
892	3.20	2,760.00	1882	.715	.08	.009	.057	
			1888	1.40		.06	0	
2,541	1.97	5,632.00	1900	1.336	.044		.013	
883	3.00	2,649.00			.013		.048	
2,000	2.00	6,608.00			.0015		.0054	
3,943	1.98	11,561.00			.007		.055	
1,067	1.98	3,884.00			.026		.209	
4,002	2.00	16,136.00		0	0	0	0	
3,933	2.25	12,780.00		0	0	0	0	
3,500								

TABLE D.—*Descriptive list of street pavements and suburban roadways.*

Street.	From—	To—	Kind of pavement or roadway.
Sheridan			Macadam
Sherman			do
Spruce and Bohrer	Florida avenue	Larch	Asphalt, H. B.
Spruce	Larch	Harewood	do
Spring	Morris road	Arthur	Gravel.
Stenben	Brightwood avenue	Sherman	Macadam
Stoughton	Fourteenth	Alley west of Fourteenth	Asphalt block
Do	Alley	Westward	Granite
Do		West to Fifteenth.	Asphalt, B. B.
Sunderland place	N and O	Nineteenth and Twentieth	Asphalt block
Superior	Champlain	Sixteenth	Gravel.
South Capitol	B	E	do
Do	E	H	Granite
Do	H	K	do
Do	K	M	Asphalt
Do	M	O	do
Do	O	P	Cobble
Do	P	River	Asphalt block
T. NW	Florida avenue	Seventh	Asphalt, H. B.
Do	Seventh	Ninth	do
Do	Ninth	Tenth	do
Do	Tenth	Fourteenth	do
Do	Fourteenth	New Hampshire avenue	do
Do	New Hampshire avenue	Florida avenue	Macadam
Do	Second	Eckington line	Asphalt, B. B.
Tenleytown road			Macadam
Tennessee avenue	East Capitol	B	Asphalt, H. B.
Do	B	D	Gravel
Thomas	Sixth	Eckington line	Asphalt, B. B.
Trenton	Brightwood avenue	Eighth	Macadam
Trinidad		King's subdivision.	do
Tunlaw road			Gravel
U. NW		Le Droit (Second) eastward.	Asphalt block
Do	Ninth	Tenth	Asphalt, H. B.
Do	Tenth	Fourteenth	do
Do	Fourteenth	Sixteenth	do
Do	Sixteenth	Eighteenth	do
Do	Twenty-eighth	Thirty-first	Macadam
Do	Thirty-first	Thirty-second	Asphalt, H. B.
Do	Thirty-second	Thirty-fifth	do
Union	M and O	Four-and-a-half and Sixth	Cobble
University place	Welling	Huntington	Asphalt, H. B.
V. NW	Thirteenth	Fourteenth	do
Do	Fourteenth	Fifteenth	do
Valley	P	U	Asphalt block
Van	Third	Four-and-a-half	do
Vermilion	Piney Branch road	Baltimore and Ohio R. R.	Gravel
Vernon	Eighteenth	Nineteenth	Asphalt, B. B.
Virginia avenue, NW		Intersection of B.	Asphalt, H. B.
Do	E	G	do
Do	G	Twenty-seventh	Gravel.
Virginia avenue, SE	Second	Third	Macadam
Do	Third	Eleventh	Gravel.
Virginia avenue, SW	South Capitol	Delaware avenue	Asphalt, H. B.
Do	Second	Four-and-a-half	Gravel.
Do	Four-and-a-half	Seventh	do
Do	Ninth	Twelfth	Granite
Vermont avenue	H	I	do
Do	K	M	Coal tar
Do			do

Repairs to asphalt pavements to July 1, 1902—Continued.

Square yards.	Price per square yard.	Original cost.	Resurfaced.		Repairs—average annual cost per square yard.			Remarks.
			Year.	Cost per square yard.	Prior to resurfacing.	Since resurfacing.	Current year.	
18,000								
3,670	\$2.25	\$11,580.00		0	0	0	0	
919	2.25	3,245.00		0	0	0	0	
2,013								
4,518	1.77							
3,051	2.00	14,776.00			\$0.009		\$0.035	
2,040	2.25							
8,483	2.25	20,713.00		0	0	0	.0018	
1,002	2.00	4,062.00			.035		.0078	
7,638	2.25	17,249.00			.037		.032	
4,502	3.00	13,507.00	1896	\$1.99	.01		0	
4,155	2.00	14,873.00			.0013		.0015	
3,498	2.25	12,258.00		0	0	0	0	
1,411	1.98	3,583.00	1902		.051		0	
733	2.25	2,248.00		0	0	0	0	
2,100								
2,114	1.77	5,618.00						
965	1.77	2,681.00						
8,555					.01		.04	Private expense.
2,321	2.25	6,993.00		0	0	0	0	Permit work.
2,700								
2,302	1.77	19,155.29						
2,000				0	0	0	.011	
1,146	1.54	2,560.00		0	0	0	0	
2,313	2.00	5,459.00			.011		.059	
8,120					.048		.078	Private expense.
9,219	2.26	21,077.00			.026		.08	
7,723	1.84	14,574.00			.045		.019	
12,000	3.20	40,319.00	1888	.83	\$0.0071		0	
			1900	1.017		0	0	
			1878	1.35		.025		
5,411	3.20	17,314.00	1893	.742		.146		
			1895	1.60		.0014	.008	
2,518	2.00	9,553.00		0		.0016	0	
15,000								
2,630				0	0	0	0	
1,620	2.25	5,079.00		0	0	0	.0086	
2,555	1.63	5,508.00		0	0	0	0	
950								
20,000								
13,000								
3,000								
4,539	2.10	11,937.00		0	0	0	0	
5,058	2.00	14,526.00	1901	1.13	.011	0	.03	
5,135	3.00	15,405.00	1892	1.045	.02	0	.0007	
			1900	.44	.045			
4,214	3.20	13,485.00	1889	.55	.023	.051		
			1894	.893		.036	.0197	
2,681	2.00	5,734.00			.012		.044	
5,004	2.10	14,205.00		0	0	0	0	
1,077	2.00	3,647.00		0	0	0	0	
1,037	2.00			0	0	0	0	Do
2,681	1.795	6,014.00		0	0	0	0	
5,800				0	0	0	0	
2,800				0	0	0	0	
1,000				0	0	0	0	
2,600								
1,733					.0016		.038	
9,000								
2,000								
2,000								

TABLE D.—*Descriptive list of street pavements and suburban roads*

Street.	From—	To—	Kind of pavement or roadway.
Sheridan.....			Macadam.....
Sherman.....			do.....
Spruce and Bohrer.....	Florida avenue.....	Larch.....	Asphalt, H. B.....
Spruce.....	Larch.....	Harewood.....	do.....
Spring.....	Morris road.....	Arthur.....	Gravel.....
Steuben.....	Brightwood avenue.....	Sherman.....	Macadam.....
Stoughton.....	Fourteenth.....	Alley west of Fourteenth.....	Asphalt block.....
Do.....	Alley.....	Westward.....	Granite.....
Do.....	West to Fifteenth.....	Nineteenth and Twentieth.....	Asphalt, B. B.....
Sunderland place.....	N and O.....		Asphalt block.....
Superior.....	Champlain.....	Sixteenth.....	Gravel.....
South Capitol.....	B.....	E.....	do.....
Do.....	E.....	H.....	Granite.....
Do.....	H.....	K.....	do.....
Do.....	K.....	M.....	Asphalt.....
Do.....	M.....	O.....	do.....
Do.....	O.....	P.....	Cobble.....
Do.....	P.....	River.....	Asphalt block.....
T, NW.....	Florida avenue.....	Seventh.....	Asphalt, H. B.....
Do.....	Seventh.....	Ninth.....	do.....
Do.....	Ninth.....	Tenth.....	do.....
Do.....	Tenth.....	Fourteenth.....	do.....
Do.....	Fourteenth.....	New Hampshire avenue.....	do.....
Do.....	New Hampshire avenue.....	Florida avenue.....	Macadam.....
Do.....	Second.....	Eckington line.....	Asphalt, B. B.....
Tenleytown road.....			Macadam.....
Tennessee avenue.....	East Capitol.....	B.....	Asphalt, H. B.....
Do.....	B.....	D.....	Gravel.....
Thomas.....	Sixth.....	Eckington line.....	Asphalt, B. B.....
Trenton.....	Brightwood avenue.....	Eighth.....	Macadam.....
Trinidad.....	King's subdivision.....		do.....
Tunlaw road.....	Le Droit (Second) eastward.....		Gravel.....
U, NW.....	Ninth.....	Tenth.....	Asphalt block.....
Do.....	Tenth.....	Fourteenth.....	Asphalt, H. B.....
Do.....	Fourteenth.....	Sixteenth.....	do.....
Do.....	Sixteenth.....	Eighteenth.....	do.....
Do.....	Twenty-eighth.....	Thirty-first.....	Macadam.....
Do.....	Thirty-first.....	Thirty-second.....	Asphalt, H. B.....
Do.....	Thirty-second.....	Thirty-fifth.....	do.....
Union.....	M and O.....	Four-and-a-half and Sixth.....	Cobble.....
University place.....	Welling.....	Huntington.....	Asphalt, H. B.....
V, NW.....	Thirteenth.....	Fourteenth.....	do.....
Do.....	Fourteenth.....	Fifteenth.....	do.....
Valley.....	P.....	U.....	Asphalt block.....
Van.....	Third.....	Four-and-a-half.....	do.....
Vermilion.....	Piney Branch road.....	Baltimore and Ohio R. R.....	Gravel.....
Vernon.....	Eighteenth.....	Nineteenth.....	Asphalt, B. B.....
Virginia avenue, NW.....	Intersection of B.....		Asphalt, H. B.....
Do.....	E.....	G.....	do.....
Do.....	G.....	Twenty-seventh.....	Gravel.....
Virginia avenue, SE.....	Second.....	Third.....	Macadam.....
Do.....	Third.....	Eleventh.....	Gravel.....
Virginia avenue, SW.....	South Capitol.....	Delaware avenue.....	Asphalt, H. B.....
Do.....	Second.....	Four-and-a-half.....	Gravel.....
Do.....	Four-and-a-half.....	Seventh.....	do.....
Do.....	Ninth.....	Twelfth.....	Granite.....
Vermont avenue.....	H.....	I.....	do.....
Do.....	K.....	M.....	Coal tar.....
Do.....			do.....

Repairs to asphalt pavements to July 1, 1902—Continued.

Square yards.	Price per square yard.	Original cost.	Resurfaced.		Repairs—average annual cost per square yard.			Remarks.
			Year.	Cost per square yard.	Prior to resurfacing.	Since resurfacing.	Current year.	
6,150	\$3.20	\$19,679.00	1893	\$1.34	\$0.026	\$0.014	\$0.002	
6,103	2.00	12,374.00			.039		.004	
4,854	.40	5,951.00						
338	1.78	602.00		0	0	0	0	
5,500								
1,358	1.63	3,381.75		0	0	0	0	
4,368	1.80	11,046.00		0	0	0	0	
2,075								
1,505	2.00	4,148.00		0	0	0	0	
2,128	2.00	8,150.00					.152	
7,000				0	.014	0	0	
16,858		52,290.00						
3,359		11,758.00						
3,526		16,846.00						
2,943		4,065.00						
3,110		4,826.00						
1,781	2.25	4,483.00		0	0	0	0	
7,000								
5,000								
2,000								
1,749	2.00			0	0	0	0	
2,566				0	0	0	.039	
3,900								
6,000								
6,516								
4,540	2.24	10,400.00	{ 1896 }	1.40	.048	.17	.042	{ Resurfacing at Garfield Monument.
7,280	1.87	15,600.00	{ 1902 }					
475								
577								
1,427	2.39	3,519.00						
700	1.98	1,386.00			.023		.0318	
535	2.41	1,310.00						
1,191	2.00	3,028.00			.009		0	
3,051	1.68	7,457.00		0	0	0	0	
1,731	1.76	4,890.00		0	0	0	0	
2,728	1.794	6,687.00		0	0	0	0	
1,160	1.63	2,172.00		0	0	0	0	
1,748	1.72	4,306.47						
1,077	1.795	2,451.00						
1,898	1.20	3,411.00					.0097	Macadam base.
7,385	1.94	15,577.00		0	0	0	0	Four-inch base.
10,432							.003	Laid by property owners.
8,822			1897					Originally laid with coal tar in 1873.
								Relaid with new pavement and asphalt surface in 1897. Includes entrances to Capitol grounds.
1,987	1.85	3,738.00			.004		.002	
5,616	2.00	13,965.00			.0005		.001	
4,500								
2,206	2.25	7,358.00		0	0	0	0	
539	2.25	1,437.00		0	0	0	0	
2,152	1.81	3,935.00						
1,260	2.00	2,631.00						
2,001	1.68	3,360.00			.005			
1,652	1.77	4,551.00						
10,200								
6,721	3.50	23,524.00						
11,198	3.50	39,194.00						

TABLE D.—*Descriptive list of street pavements and suburban roadways.*

Street.	From—	To—	Kind of pavement or roadway.
Vermont avenue .....	M .....	P .....	Coal tar .....
Do. ....	P .....	R .....	Asphalt, H. B. ....
Do. ....	R .....	T .....	Macadam .....
Do. ....	Intersection of N. ....		Asphalt, B. B. ....
Do. ....	T .....	Florida avenue .....	Gravel .....
W. NW .....	Twelfth .....	Thirteenth .....	Asphalt, H. B. ....
Do. ....	Thirteenth .....	Fifteenth .....	do .....
Wallach .....	T and U .....	Thirteenth and Fourteenth .....	Asphalt block .....
Ward place .....	M and N .....	New Haven and Twenty-second .....	Asphalt, B. B. ....
Washington .....	G and H .....	Fourth and Fifth .....	do .....
Do. ....	Nichols avenue .....	Taylor .....	Gravel .....
Water .....	Seventh .....	Twelfth .....	Granite .....
Do. ....	N .....	O .....	do .....
Do. ....	M .....	Sixth .....	do .....
Water (south side) .....	P, westward .....		Vitrified block .....
Water .....	Twelfth .....	Thirteen-and-a-half .....	Granite .....
Welling .....	Fourteenth .....	University place .....	Asphalt, H. B. ....
Whitney avenue .....	do .....	Brightwood avenue .....	Macadam .....
Do. ....	Brightwood avenue, eastward .....		do .....
Willard .....	T and U .....	Seventeenth and Eighteenth .....	Gravel .....
Westminster .....	S and T .....	Ninth and Tenth .....	Asphalt, B. B. ....
Wyoming .....	Eighteenth .....	Columbia road .....	do .....
Do. ....	Columbia road, westward .....		do .....
One-half, SE .....	I .....	N .....	Macadam .....
One-half, SW .....	G .....	do .....	do .....
First, NW .....	Maryland avenue .....	Pennsylvania avenue .....	Asphalt, H. B. ....
Do. ....	Pennsylvania avenue .....	F .....	Granite .....
Do. ....	B .....	C .....	Asphalt block .....
Do. ....	do .....	do .....	Vitrified block .....
Do. ....	Massachusetts avenue .....	H .....	do .....
Do. ....	H .....	Defrees .....	Asphalt .....
Do. ....	Defrees .....	I .....	Granite .....
Do. ....	I .....	K .....	Asphalt, B. B. ....
Do. ....	K .....	Pierce .....	Asphalt, H. B. ....
Do. ....	Pierce .....	New York avenue .....	do .....
Do. ....	New York avenue .....	O .....	do .....
Do. ....	O .....	P .....	do .....
Do. ....	P .....	Q .....	do .....
Do. ....	Q .....	Florida avenue .....	do .....
Do. ....	Florida avenue .....	S .....	Asphalt .....
Do. ....	S .....	W .....	do .....
Do. ....	W .....	Michigan avenue .....	do .....
First, E .....	B, North .....	B, South .....	do .....
First, NE .....	B .....	C .....	Asphalt, H. B. ....
Do. ....	C .....	F .....	Asphalt, B. B. ....
Do. ....	F .....	L .....	Gravel .....
Do. ....	Q .....	R .....	Asphalt, H. B. ....
Do. ....	R .....	Alley .....	do .....
First, SE .....	B .....	C .....	Granite .....
Do. ....	C .....	D .....	Asphalt block .....
Do. ....	D .....	E .....	Asphalt, H. B. ....
Do. ....	E .....	G .....	Asphalt block .....
Do. ....	I .....	River .....	Gravel .....
First, SW .....	Maryland avenue .....	Virginia avenue .....	Trap .....
Do. ....	Virginia avenue .....	M .....	do .....

repairs to asphalt pavements to July 1, 1902—Continued.

Square yards.	Price per square yard.	Original cost.	Resurfaced.		Repairs—average annual cost per square yard.			Remarks.
			Year.	Cost per square yard.	Prior to resurfacing.	Since resurfacing.	Current year.	
6,150	\$3.20	\$19,679.00	1893	\$1.34	\$0.028	\$0.014	\$0.002	
6,108	2.00	12,374.00			.039		.004	
4,854	.40	5,951.00						
388	1.78	692.00		0	0	0	0	
5,500								
1,358	1.63	3,381.75		0	0	0	0	
4,388	1.80	11,046.00		0	0	0	0	
2,075								
1,505	2.00	4,148.00		0	0	0	0	
2,128	2.00	8,159.00					.152	
7,000				0	.014	0	0	
16,858		52,280.00						
3,359		11,758.00						
3,528		16,846.00						
2,943		4,085.00						
3,110		4,828.00						
1,781	2.25	4,483.00		0	0	0	0	
7,000								
5,000								
2,000								
1,749	2.00			0	0	0	0	
2,506				0	0	0	.089	
3,900								
6,000								
6,516								
4,540	2.24	10,460.00	{ 1896 }	1.40	.048	.17	.042	{ Resurfacing at Garfield Monument.
7,280	1.87	15,600.00	{ 1902 }					
475								
577								
1,427	2.30	3,519.00						
700	1.98	1,396.00			.023		.0818	
535	2.41	1,310.00						
1,191	2.00	3,028.00			.009		0	
3,051	1.68	7,457.00		0	0	0	0	
1,731	1.76	4,800.00		0	0	0	0	
2,728	1.794	6,687.00		0	0	0	0	
1,180	1.63	2,172.00		0	0	0	0	
1,748	1.72	4,308.47						
1,077	1.786	2,451.00						
1,898	1.80	3,411.00					.0057	Macadam base.
7,385	1.94	15,577.00		0	0	0	0	Four-inch base.
10,422							.003	Laid by property owners.
8,822			1897					Originally laid with coal tar in 1873.
1,987	1.85	3,736.00			.004		.082	Relaid with new pavement and asphalt surface in 1897.
5,616	2.00	13,965.00			.0005		.001	Includes entrances to Capitol grounds.
4,500								
2,206	2.25	7,358.00		0	0	0	0	
538	2.25	1,437.00		0	0	0	0	
2,152	1.81	3,985.00						
1,260	2.00	2,631.00						
2,001	1.68	3,960.00			.005			
1,652	1.77	4,351.00						
10,200								
6,721	8.50	23,524.00						
11,198	8.50	36,194.00						

TABLE D.—*Descriptive list of street pavements and suburban roadways.*

Street.	From—	To—	Kind of pavement or roadway.
First, SW	M	N	Rubble
Do.	N	River	Gravel
Second, NW	Pennsylvania avenue	Indiana avenue	Granite
Do.	Indiana avenue	I	Asphalt, H. B.
Second (Le Droit avenue).	Florida avenue	W	do.
Second, NE. and SE.	Pennsylvania avenue	Maryland avenue	do.
Second, NE	Maryland avenue	C	Asphalt block
Do.	C	F	do.
Do.	F	H	Asphalt, H. B.
Do.	K	L	Gravel
Do.	R	T	Asphalt, H. B.
Second, SE	Pennsylvania avenue	D	Asphalt, H. B.
Do.	D	G	Macadam
Do.	Virginia avenue	I	do.
Do.	K	L	do.
Second, SW	Maryland avenue	C	Asphalt, H. B.
Do.	C	Virginia avenue	Asphalt, H. B.
Do.	Virginia avenue	F	Asphalt, H. B.
Do.	F	Delaware avenue	Macadam
Third, NW	Pennsylvania avenue	D	Granite
Do.	Intersection of D.		Asphalt, H. B.
Do.	D	L	Asphalt, H. B.
Do.	L	New York avenue	Asphalt, H. B.
Do.	New Jersey avenue	P	do.
Do.	P	Q	do.
Do.	Q	R	do.
Do.	R	Florida avenue	do.
Third, NW (Harewood avenue).	Florida avenue	Elm	Gravel
Third, NE	East Capitol	Maryland avenue	Asphalt, H. B.
Do.	Maryland avenue	C	Asphalt block
Do.	C	F	Asphalt, H. B.
Do.	F	H	Asphalt, H. B.
Do.	Quincy	R	do.
Do.	R	T	Asphalt
Third, SE	East Capitol	Pennsylvania avenue	Asphalt, H. B.
Do.	Pennsylvania avenue	C	Asphalt block
Do.	C	D	Granite
Do.	D	Virginia avenue	Belgian
Do.	M	N	Rubble
Do.	Virginia avenue	K	Granite
Do.	K	M	Macadam
Third, SW	Pennsylvania avenue	B. South	Granite
Do.	B	Virginia avenue	Asphalt, H. B.
Do.	Virginia avenue	F	do.
Do.	F	H	do.
Do.	H	I	do.
Do.	I	K	do.
Do.	K	N	do.
Fourth (John Marshall place).	Pennsylvania avenue	D	Asphalt block
Fourth, NW	do.	Missouri avenue	Asphalt, H. B.
Do.	Indiana avenue	New York avenue	Coal tar
Do.	New York avenue	New Jersey avenue	Granite
Do.	New Jersey avenue	Florida avenue	Asphalt, H. B.
Fourth (Linden)	Florida avenue	Maple	do.
Fourth, NW	Maple	College	Macadam

## Repairs to asphalt pavements to July 1, 1902—Continued.

Square yards.	Price per square yard.	Original cost.	Resurfaced.		Repairs—average annual cost per square yard.			Remarks.
			Year.	Cost per square yard.	Prior to resurfacing.	Since resurfacing.	Current year.	
2,315 13,750 3,693 10,452 6,061	\$1.06 1.87 2.08 2.25	\$2,430.00 7,137.00 22,534.00 18,454.00						Permit work.
				0	\$0.044 0	0	\$0.046 0	
4,751 1,846 4,323 3,885 1,088	2.09 1.984 2.00 2.00	10,589.00 4,787.00 10,788.00 7,596.00	1898	\$1.45	.028 .004	\$0.018	.0046 .018	
4,214 4,906 2,089 1,206 1,219	2.00 2.27 .93 .96	8,702.00 11,572.00 4,836.00 2,115.00		0	0 .035	0	0 .038	
2,532 3,179 511 4,627 4,251	2.25 2.00 2.25 .57 1.72	10,013.00 12,235.00 2,227.00 5,171.00 7,518.00		0	0 .023 0	0	.011 0 0	
496 16,350 2,685 4,177 2,077		800.00 52,631.00 4,779.00 12,368.00 5,497.00	1893 1894	0 1.42 .06	0 .014 .038	0 .08	0 .032 .08	Do. Private expense.
529 2,205 4,900	1.80 1.796	1,798.00 5,189		0 0	0 0	0 0	0 0	
3,121 1,080	2.25 1.99	7,437 2,977		0	.045 0	0	.024 0	
4,314 3,834 1,133 3,000 3,521	2.00 2.25 2.25 2.08	10,850 9,184 3,377 7,791			.0018 0 0 0		.058 0 0 0	
987 2,572 5,060 2,017 2,467	1.99 2.20 3.50 1.08	2,562 5,690 17,607 9,400						
2,000 5,941 5,860 2,088 2,947	1.82 2.25 2.25 1.68	11,006 17,548 6,998 5,460	1901 1902	1.936 0	.058 0	0 0	0 .04 0	Resurfaced, E to F.
1,342 1,472 6,325 4,549	1.63 1.56 1.78 2.00	2,699 3,087 13,598 14,690		0 0 0	0 0 0	0 0 0	0 0 0	
2,287				0	0	0	0	
14,291	3.20	45,732	1878 1888 1891 1902	1.39 .37 .325	.019 .014 .013		.011	
2,400 4,594 2,145 5,038 2,537	2.25 2.25	13,538 6,952		0 0	0 0	0 0	0 0	

TABLE D.—*Descriptive list of street pavements and suburban roadways.*

Street.	From—	To—	Kind of pavement or roadway.
Seventh, NW, westside	Market space	D	Granite
Seventh, NW	Pennsylvania avenue	D	Coal tar
	(East side, Market space to D.)		
Do.	D to E and G to Q.		Granite
Do.	Intersections G, H, and I.		do
Do.	E	G	Asphalt, H. B.
Seventh, NW, (westside)	Q	Florida avenue	Granite
Seventh, NW	Q	do	do
Seventh, NE	East Capitol	Massachusetts avenue	Asphalt block
Do.	Massachusetts avenue	Maryland avenue	do
Do.	Maryland avenue	Florida avenue	Gravel
Seventh, SE	East Capitol	Pennsylvania avenue	Asphalt block
Do.	Pennsylvania avenue	Virginia avenue	do
Do.	Virginia avenue	M	Macadam
Seventh, SW	B, N	B, S	Trap
Do.	B, S	Water	Granite
Eighth, NW	Pennsylvania avenue	E	do
Do.	E	F	Concrete
Do.	G	L	Asphalt, H. B.
Do.	L	N	Asphalt, B. B.
Do.	N	R	Asphalt, H. B.
Do.	R	S	Coal tar
Do.	S	Florida avenue	do
Do.	Florida avenue	Grant avenue	Macadam
Eighth, NE	East Capitol	Massachusetts avenue	Asphalt block
Do.	Massachusetts avenue	Maryland avenue	do
Do.	Maryland avenue	I	Gravel
Do.	I	K	Macadam
Do.	L	Florida avenue	do
Eighth, SE	East Capitol	North Carolina avenue	Asphalt, H. B.
Do.	North Carolina avenue	Pennsylvania avenue	Asphalt
Do.	Pennsylvania avenue	K	Asphalt, H. B.
Do.	K	M	do
Do.	Intersection of M.		do
Eighth, SW	B	C	Asphalt
Do.	C	E	Asphalt, H. B.
Do.	E	H	do
Do.	H	Water	Gravel
Ninth, NW	B	Pennsylvania avenue	Granite
Do.	Pennsylvania avenue	F	Asphalt, H. B.
Do.	F	P	Coal tar
Ninth, NW, (east side)	P	Rhode Island avenue	Asphalt, H. B.
Ninth, NW, (west side)	P	Florida avenue	do
Ninth, NW, (east side)	Rhode Island avenue	do	do
Ninth, NW	Florida avenue	Grant avenue	Macadam
Ninth, NE	East Capitol	Massachusetts avenue	Asphalt, H. B.
Do.	Massachusetts avenue	Maryland avenue	Asphalt block
Do.	Maryland avenue	H	Asphalt
Do.	H	I	Gravel
Do.	G	Florida avenue	Macadam
Ninth, SE	East Capitol	A	Asphalt block
Do.	A	Pennsylvania avenue	Macadam
Do.	Pennsylvania avenue	E	Asphalt, H. B.
Do.	South Carolina avenue	Pennsylvania avenue	Asphalt block
Do.	I	K	Gravel
Do.	K	M	Macadam

# OPERATIONS OF THE ENGINEER DEPARTMENT, D. C. 39

Repairs to asphalt pavements to July 1, 1902—Continued.

F. L.	Square yards.	Price per square yard.	Original cost.	Resurfaced.		Repairs—average annual cost per square yard.			Remarks.
				Year.	Cost per square yard.	Prior to resurfacing.	Since resurfacing.	Current year.	
5	4,526	\$2.10	\$10,228						
7	1,912	2.00	4,472						
9	837	2.00	1,972.00						
1	3,101	1.77	7,277.19						
	3,620								
4	3,021	1.68	6,120.00		0	0	0	0	
8	781	1.57	2,455.00		0	0	0	0	
9	1,067	1.76	2,060.00		0	0	0	0	
	2,400								
0	861	2.25	2,867.00		0	0	0	\$0.0019	Permit work.
	4,700				0	0	0	.0019	Private expense.
2	2,026	1.72	5,730.28						
	17,000								
7	4,152				0	0	0	0	On asphalt block.
0	593	2.00	1,386.00						
8	6,684	1.77	15,834.00						
9	7,706	1.77	18,630.00						
0	4,833	2.00	18,978.00			\$0.041		.074	
2	12,851	2.29	30,527.00						
9	14,566	1.68	48,423.00						
5	3,341	2.25	11,592.00	{ 1894	\$0.48	.02	\$0.036	.024	
4	380	2.18		{ 1895	.38		.011	.018	Widening east side.
0	200				0	0	0	0	Widening westside.
3	7,389	3.20	23,644.00	{ 1878	1.71		.017		
0	1,795			{ 1887	.529		.028	0	Widening.
					0	0	0	0	
9	5,666	1.46	8,793.00				.024	.025	
0	3,123	2.00	7,764.00				.021	.1113	
0	4,436	2.00	11,654.00				.02	.0042	
0	1,516	2.00	4,334.00				.008		
0	734	2.00	1,878.00		0	0	0	0	
0	4,876	2.10	12,131.00						
0	875	2.00	2,060.00						
	12,500								
2	4,916	2.27	11,403.00			.027		.16	
0	693	2.00	1,675.00						
4	2,570	1.93	5,879.00		0	0	0	0	4-inch base.
0	1,851	1.77	4,354.00		0	0	0	0	
2	2,197								
5	5,078	2.25	14,037.00	1900	1.45	.034		0	Includes 1,099 yards of granite.
7	2,987	1.98	5,915.00	{ 1882	.80	.011	.033		
				{ 1900	1.06		0	0	
78	1,313	1.78	2,337.00	1889	2.10	.025	.014	.037	
0	975	1.71	1,665.00						Covered with asphalt binder, 1896.
57	6,896	1.97	17,992.00	{ 1899	1.01	.047	.12		
0	16,636	1.85	31,645.00	{ 1901	.92			0	
0	977	1.76	2,402.00		0	0	0	.017	
								0	
	7,000								
0	4,626	2.10	10,800.00						
7	1,908	2.00	4,690.00						
0	1,838	2.00	1,975.00						
	3,000								
0	3,640	1.80	10,045.00		0	0	0	0	
	4,160				0	0	0	0	
	4,000								
0	5,949	2.10	13,787.00						
57	4,399	1.99	10,430.00						
0	4,775	2.00	12,151.00						
	8,940								
73	23,179	3.45	79,768.00						
0	1,477	1.77	4,409.00						
78	1,555	1.70	2,643.00						

42 OPERATIONS OF THE ENGINEER DEPARTMENT, D. C.

TABLE D.—*Descriptive list of street pavements and suburban roadways.*

	From—	To—	Kind of pavement or roadway.
N. W.	B	C	Asphalt
Do.	B	Water	Granite
Do.	B	Pennsylvania avenue	do.
Do.	C	E	Asphalt, H. B.
Do.	E	F	do.
Do.	F	G	do.
Do.	G	K	Coal tar
Do.	K	M	Asphalt, H. B.
Do.	M	O	do.
Do.	O	R	do.
Do.	R	S	Coal tar
Do.	S	T	Asphalt, H. B.
Do.	T	U	do.
Do.	U	Florida avenue	do.
Twelfth, NE.	East Capitol	C	Asphalt block
Do.	C	Maryland avenue	Gravel
Do.	Maryland avenue	G	Asphalt, H. B.
Do.	G	H	do.
Do.	H	I	Gravel
Twelfth, SE.	East Capitol	D	Macadam
Do.	D	Pennsylvania avenue	Asphalt block
Do.	Pennsylvania avenue	I	do.
Do.	I	L	do.
Do.	K	M	Macadam
Twelfth, SW.	B	Maryland avenue	Asphalt block
Do.	D	Water	Cobble
Eleventh, E. NW.	B	D	Asphalt, H. B.
Do.	D	E	do.
Do.	E	F	Granite
Do.	F	G	do.
Do.	G	K	Coal tar
Do.	K	O	Granite
Do.	O	Florida avenue	Asphalt, H. B.
Eleventh, E. NE.	East Capitol	Massachusetts avenue	Asphalt block
Do.	Massachusetts avenue	C	do.
Do.	C	Maryland avenue	Gravel
Do.	Maryland avenue	Florida avenue	Macadam
Eleventh, SE.	East Capitol	C	Asphalt block
Do.	C	Pennsylvania avenue	do.
Do.	Pennsylvania avenue	Eastern Branch	Granite
Eleventh, SE. west side	M	do.	do.
Eleventh, SW	B. south	Water	Belgian
Twelfth, NW.	C	D	Asphalt, H. B.
Do.	D	E	do.
Do.	E	F	Granite
Do.	F	N	Coal tar
Do.	Intersection of G.		Asphalt, H. B.
Do.	O	do.	do.
Do.	Rhode Island avenue	do.	do.
Do.	Vermont avenue	do.	Coal tar
Do.	R	S	do.
Do.	S	V	Asphalt, B. B.
Do.	V	Florida avenue	Asphalt, H. B.
Twelfth, NE.	Lincoln square northward.		do.
Do.	Extension to 144 feet south of B.		do.
Do.	C	Maryland avenue	Macadam
Do.	Maryland avenue	H	do.
Do.	H	Florida avenue	do.
Do.	Florida avenue	Mount Olivet road	do.
Do.	Detroit	Bunker Hill road	Gravel

Repairs to asphalt pavements to July 1, 1902—Continued.

Square yards.	Price per square yard.	Original cost.	Resurfaced.		Repairs—average annual cost per square yard.			Remarks.
			Year.	Cost per square yard.	Prior to resurfacing.	Since resurfacing.	Current year.	
507	\$1.63	\$838.00						
1,579	3.00	4,738.00	1881	\$0.78		\$0.057	\$0.014	
18,465	2.61	48,279.00						
2,089	2.50	5,173.00						
3,528	1.47	5,191.00		0	0	0	0	In place of granite.
4,340	2.74	16,197.00						
3,406		9,308.00						
3,340	1.99	8,942.00						
3,315	2.00	11,144.00						
10,400								
7,223	1.98	22,140.00						
8,304	2.00	27,312.80						
1,735	.98	3,511.00						
4,926	8.30	22,855.00						
15,169	1.70	25,787.00						
3,653	1.87	6,925.00						
1,933	1.80	3,731.00	1882	1.36	\$0.056		.031	
4,833	2.22	11,202.00			.043		.022	
3,310	3.00	11,202.00	1891	1.08	.008	.009	.016	Resurfaced P to Q.
6,486	2.22	14,973.00	1902		.039		.05	
2,083	1.98	5,227.00	1900		.074	0	0	
3,624	2.00	8,937.00			.021		.01	
4,840								
2,989	2.00	7,342.00						
5,856	2.00	16,605.00						
8,000								
1,311	.96	1,781.00						
1,500								
2,508	1.68	6,299.00		0	0	0	0	4-inch base.
4,765	1.93	10,498.00		0	0	0	0	
9,182	1.92	17,630.00			.031		.018	
2,929	2.33	6,825.00			.015		.065	In place of cobble.
480		1,071.00		0	0	0	0	On cobble base.
1,424	1.20	3,158.00			.006			
3,035	2.25	7,800.00			.001		.0075	
3,573	1.68	7,459.00		0	0	0	0	
1,800								
2,280	1.91	4,816.00						
3,381	2.26	9,004.00		0	0	0	0	In place of coal tar.
			1878	.54		.031		
			1884	.37				
			1885	.206				
23,962	3.20	94,558.00	1886	.215				
			1887	.032		.024		
			1887	.43				
			1886	.038		.043	.0048	
1,583	2.28	3,638.00			.03		.106	
6,147	1.46	9,513.00			.007		.0052	
3,371	2.30	7,759.00			.02		.026	
3,500								
1,217	2.00	4,035.00		0	0	0	0	4-inch base.
6,712	2.00	21,599.00						
5,781	2.00	17,962.00		0	0	0	0	
2,160								
2,300								
1,218	1.77	2,372.96						
4,595	.96	12,632.00						
817	1.79	2,351.00		0	0	0	0	
1,247	1.77	2,180.00						
1,000								
2,000								

## 42 OPERATIONS OF THE ENGINEER DEPARTMENT, D. C.

TABLE D.—*Descriptive list of street pavements and suburban roadways.*

Street.	From—	To—	Kind of pavement or roadway.
Ninth, SW	B	C	Asphalt
Do.	C	Water	Granite
Tenth, NW	B	Pennsylvania avenue	do
Do.	D	E	Asphalt, H. B.
Do.	E	F	do
Do.	F	G	do
Do.	G	K	Coal tar
Do.	K	M	Asphalt, H. B.
Do.	M	O	do
Do.	O	R	do
Do.	R	S	Coal tar
Do.	S	T	Asphalt, H. B.
Do.	T	U	do
Do.	U	Florida avenue	do
Tenth, NE	East Capitol	C	Asphalt block
Do.	C	Maryland avenue	Gravel
Do.	Maryland avenue	G	Asphalt, H. B.
Do.	G	H	do
Do.	H	I	Gravel
Tenth, SE	East Capitol	D	Macadam
Do.	D	Pennsylvania avenue	Asphalt block
Do.	Pennsylvania avenue	I	do
Do.	do	I	do
Do.	K	M	Macadam
Tenth, SW	B	Maryland avenue	Asphalt block
Do.	D	Water	Cobble
Eleventh, NW	B	D	Asphalt, H. B.
Do.	D	E	do
Do.	E	F	Granite
Do.	F	G	do
Do.	G	K	Coal tar
Do.	K	O	Granite
Do.	O	Florida avenue	Asphalt, H. B.
Eleventh, NE	East Capitol	Massachusetts avenue	Asphalt block
Do.	Massachusetts avenue	C	do
Do.	C	Maryland avenue	Gravel
Do.	Maryland avenue	Florida avenue	Macadam
Eleventh, SE	East Capitol	C	Asphalt block
Do.	C	Pennsylvania avenue	do
Do.	Pennsylvania avenue	Eastern Branch	Granite
Eleventh, SE. (west side)	M	do	do
Eleventh, SW	B, south	Water	Belgian
Twelfth, NW	C	D	Asphalt, H. B.
Do.	Pennsylvania avenue	E	do
Do.	E	F	Granite
Do.	F	N	Coal tar
Do.	Intersection of G.		Asphalt, H. B.
Do.	N	O	do
Do.	O	Rhode Island avenue	do
Do.	Rhode Island avenue	Vermont avenue	Coal tar
Do.	R	S	do
Do.	S	V	Asphalt, H. B.
Do.	V	Florida avenue	Asphalt, H. B.
Twelfth, NE	Lincoln square northward.		do
Do.	Extension to 144 feet south of B.		do
Do.	C	Maryland avenue	Macadam
Do.	Maryland avenue	H	do
Do.	H	Florida avenue	do
Do.	Florida avenue	Mount Olivet road	do
Do.	Detroit	Bunker Hill road	Gravel

Repairs to asphalt pavements to July 1, 1903—Continued.

No.	Square yards.	Price per square yard.	Original cost.	Resurfaced.		Repairs—average annual cost per square yard.			Remarks.
				Year.	Cost per square yard.	Prior to resurfacing.	Since resurfacing.	Current year.	
9	1,454	\$1.20	\$2,879.00			\$0.008		0	Cobble base.
2	7,081		22,859.00						
2	2,103	3.20	9,227.00						
8	2,487	1.75			0	0	0	0	
			12,256.00						Laid in 1885, widened 1896; practically new pavement. Roadway widened, granite removed.
8	2,000	1.75			0	0	0	0	
0	955	1.74	1,775.00			.049		\$0.037	
5	4,828	3.00	14,913.00	1889	\$1.25	.014	\$0.037	.043	
0	3,896	1.47	5,074.00	1891	.43		.016	.013	
1	3,443	1.85	6,519.00				.017	.013	
3	4,438	2.28	10,109.00				.009	.084	
							.043	.11	
7	1,922	1.98	6,640.00	1901	1.00	.068		.044	
1	1,948	2.25	6,344.00		0	0	0	0	
5	2,588	1.68	6,075.00		0	0	0	0	
0	4,053	1.80	12,291.00		0	0	0	0	
7	4,208	1.77	10,972.00						
	2,070	1.98			0	0	0	0	4-inch base.
3	2,915	2.00			0	0	0	0	
2	2,061				0	0	0	0	
	2,160								
3	4,748	.98	8,086.00						
1	788	2.00	2,499.00						
5	4,478	1.84	11,449.00						
7	449	1.80	1,017.00						
1	1,500								
5	2,411	2.10	5,544.00						In place of cobble.
3	2,589	.70	1,812.00		0	0	0	0	
7	3,854	1.45	8,408.00	1891	1.736	.032	.012	.214	
3	2,500	1.78	4,451.00						
3	1,784	2.11	3,689.00						
0	1,214	1.89	2,321.00						
5	3,896	3.00	12,813.00	1896	.59	.045	.067	.015	
0	4,326	1.73	8,104.00						
1	8,784	2.25	37,118.00			.002		.024	
5	1,086	1.84	2,500.00						
0	4,202	1.77	9,412.00						
	2,300								
5	6,951	.68	5,642.00						
1	8,076	2.00	23,776.00						
3	7,006	2.00	19,523.00						
0	15,451	.91	53,724.00						
2	4,698	2.70	11,791.00						
3	10,511	3.45	36,893.00		0	0	0	0	
7	1,911	1.55	4,396.00	1896	.946	.02	.068	.055	
5	1,222	1.78	2,316.00						
0	1,627	2.11	3,434.00						
5	13,039	3.00	40,517.00	1899	.117	.005	.04	.021	
1	198	2.04	407.00	1894	.845		.023		
1	1,522	1.85	2,873.00		0	.041	0	0	
3	1,859	2.27	4,240.00			.035		.114	
7	2,304	1.98	8,120.00			.048		.124	
3	1,798	2.00	8,177.00			.004		.031	
0	5,877	2.00	18,873.00			.006		0	
1	3,554	2.25	12,542.00		0	0	0	.018	
5	590	1.68	1,024.00		0	0	0	0	
5	1,737	1.76	8,890.00		0	0	0	0	
1	4,770								
0	4,374	.98	4,450.00						
0	3,543		6,189.00						
5	10,544	.91	10,817.00						
1	13,758	.20	7,398.00						

TABLE D.—*Descriptive list of street pavements and suburban roadways.*

Street.	From—	To—	Kind of pavement or roadway.
Twelfth, SE	East Capitol	Pennsylvania avenue	Gravel
Twelfth, SW	Pennsylvania avenue to B. N	Ohio avenue and B to river	Belgian
Do.	B. N	B. S.	do
Thirteenth, NW	B.	C	Asphalt, H. B.
Do.	C	Pennsylvania avenue	Coal tar
Do.	Pennsylvania avenue	E	Asphalt, H. B.
Do.	E	F	Granite
Do.	F	P	Coal tar
Do.		Around Iowa circle.	do
Do.	P	Corcoran	Asphalt, H. B.
Do.	Corcoran	T	do
Do.	T	Florida avenue	do
Do.	Florida avenue	Clifton	Macadam
Do.	Clifton	Whitney avenue	do
Do.	Whitney avenue	Spring road	Gravel
Thirteenth, NE	Emerson	Maryland avenue	Asphalt, B. B.
Thirteenth, SE	East Capitol	D	Gravel
Do.	D	Pennsylvania avenue	Macadam
Thirteenth, SW	B.	Maryland avenue	Coal tar
Thirteen-and-a-half, NW	do	E	Cobble
Thirteen-and-a-half, SW	do	D	Asphalt block
Fourteenth, NW	do	Pennsylvania avenue	Coal tar
Do.	Pennsylvania avenue	F	Granite
Do.	F	New York avenue	Coal tar
Do.	New York avenue	H	do
Fourteenth, NW, (east side).	H	Florida avenue	Asphalt, H. B.
Fourteenth, NW, (west side).	H	M	do
Do.	M	Florida avenue	do
Fourteenth, NW, (east side).	Florida avenue	Clifton	do
Do.	Clifton	Roanoke	do
Fourteenth, NW, (west side).	Florida avenue	Euclid	do
Fourteenth, NW		Yale, northward.	do
Do.		Extension to park.	do
Fourteenth, NW, (east side).	Kenyon	Park	do
Fourteenth Street road			
Fourteenth, NE	East Capitol	E	Gravel
Do.	Maryland avenue	E	Macadam
Fourteenth, SE	East Capitol	Pennsylvania avenue	Gravel
Fourteenth, SW	B. north	B. south	Belgian
Do.	B. south	Alley south of B.	Asphalt, H. B.
Do.	Alley south of B.	Maryland avenue	Granite
Fifteenth, NW	B	E	Asphalt
Do.	E	Pennsylvania avenue	Asphalt, H. B.
Do.	Pennsylvania avenue	New York avenue	do
Do.	New York avenue	Vermont avenue	Coal tar
Do.	I	K	do
Do.	K	Rhode Island avenue	Asphalt, H. B.
Do.	Rhode Island avenue	S	Coal tar
Do.	S	U	Asphalt, H. B.
Do.	U	V	do

## Repairs to asphalt pavements to July 1, 1902—Continued.

No. id.	Square yards.	Price per square yard.	Original cost.	Resurfaced.		Repairs—average annual cost per square yard.			Remarks.
				Year.	Cost per square yard.	Prior to resurfacing.	Since resurfacing.	Current year.	
85	11,305	\$0.59	\$6,979.00						
72	10,708	3.00	37,858.00						
73	8,187	3.50	28,655.00						
78	1,780	1.78	3,182.00	1883	\$1.321	\$0.073	\$0.105	\$0.04	
76	3,087	3.00	9,803.00	1887	1.49	.018	.032	.031	
78	685	1.79	1,236.00			.057		.10	
78	1,741	2.11	3,708.00						
73	15,688	3.20	50,758.00	1888	.28	.047			
73	8,888	3.20	28,382.00	1889	.341		.018	.016	
81	2,126	2.09	4,869.00	1885	1.75	.009	.006	.028	
84	4,273	2.25	10,558.00			.037		.059	
91	7,271	2.25	20,372.00		0	.041		.037	
96	2,700					0	0	.0035	
96	14,000								
96	5,800								
92	1,735	2.00	4,401.00		0	0	0	0	
96	11,013	.124	6,194.00						
91	2,638	.95	5,255.00						
75	5,706	3.60	17,117.00	1891	1.27	.021	.032	.002	East side laid by railway company.
95	3,016	1.84	6,895.00						
87	8,852	1.97	22,512.00	1894	.484	.049	.121	.034	
84	1,784	2.394	8,444.00						
73	3,732	3.20	11,942.00	1894	1.546	0.008	.053	.055	
74	1,549	3.20	4,957.00	1885		.022	.023	.012	
79	29,085	1.97	60,212.00	1891	.893	.03	.004		
79	5,682	1.75	10,287.00	1893	.841		.015	.004	
92	14,583	2.28	33,717.00	1896	.022	.033	.037	.03	
99	3,764	2.00		1894	1.09				
98	879	1.77		1901	.618	.031		.021	4-inch base.
100	2,728	1.77			0	0	0	.0088	In place of 4-inch base.
91	3,735	2.25			0	0	0	0	Do.
92	4,807	2.25			0	0	0	.0076	
94	486	1.68			0	0	0	.0116	Widening.
94	6,600							0	
973	7,841	3.50	27,448.00						
980	961	1.47	2,628.00		0	0	0	0	In place of granite.
983	5,653	1.40							
984	5,252	1.03	7,643.00					.0016	On asphalt block.
983	1,732							.0037	In place of asphalt block.
989	4,219	2.35	13,410.00			.042		.019	8-inch base.
973	7,005	3.20	22,416.00	1879	.967		.014	.006	
973	1,724	3.00	5,518.00	1891	1.39		.016	.035	West side McPherson square.
981	6,921	1.85	12,907.00			.018		.006	
973	7,516	3.00	22,548.00	1887	.755	.012	.07	.0037	
983	3,788	2.25	9,488.00	1891	.65		.007	.01	
986	1,486	1.68	3,669.00		0	.0055		.018	
					0	0	0		

## 46      OPERATIONS OF THE ENGINEER DEPARTMENT, D. C.

TABLE D.—*Descriptive list of street pavements and suburban roads*

Street.	From—	To—	Kind of pavement or roadway.
Fifteenth, NE	East Capitol	E	Gravel
Do.	E	H	Asphalt
Fifteenth, SE	East Capitol	H	Gravel
Fifteen-and-a-half, NW. (Madison place).	Pennsylvania avenue	H	Coal tar
Sixteenth, NW	H	Scott square	Asphalt, H. B.
Do.	Scott square	R	do.
Do.	R	156 feet south of Florida avenue.	do.
Do.	156 feet south of Florida avenue.	Morris	do.
Do.	Morris	Superior	Macadam
Do.	Kenesaw	Park	do.
Sixteen-and-a-half, NW. (Jackson place).	Pennsylvania avenue	H	Coal tar
Seventeenth, NW	B	E	do.
Do.	E	New York avenue	Asphalt, H. B.
Do.	New York avenue	Pennsylvania avenue	Asphalt, B. B.
Do.	Pennsylvania avenue	I	Coal tar
Do.	I	Massachusetts avenue	do.
Do.	Massachusetts avenue	P	do.
Do.	P	Q	do.
Do.	Q	R	Asphalt, B. B.
Do.	R	T	do.
Do.	T	Florida avenue	Asphalt
Do.	Grant	Lowell	Macadam
Eighteenth, NW	Virginia avenue	D	do.
Do.	E	New York avenue	Coal tar
Do.	E	Pennsylvania avenue	Asphalt, H. B.
Do.	Pennsylvania avenue	K	Coal tar
Do.	K	L	Asphalt block
Do.	L	P	Coal tar
Do.	P	Q	Asphalt, H. B.
Do.	New Hampshire avenue.	S	do.
Do.	S	Florida avenue	do.
Do.	Florida avenue	Columbia road	Asphalt, B. B.
Do.	do	Fourth	Asphalt, H. B.
Do.	do	Sixth	do.
Do.	Grant	Howard	Macadam
Nineteenth, NW	Virginia avenue	E	do.
Do.	E	Pennsylvania avenue	Coal tar
Do.	Pennsylvania avenue	K	Granite
Do.	K	M	do.
Do.	M	N	do.
Do.	N	Circle	Asphalt, H. B.
Do.	P	Florida avenue	Coal tar
Do.	Florida avenue	Columbia road	Asphalt, H. B.
Do.	Baltimore	Cincinnati	do.
Twentieth, NW	Virginia avenue	E	Macadam
Do.	E	Pennsylvania avenue	Coal tar
Do.	Pennsylvania avenue	I	Asphalt, H. B.
Do.	I	K	Granite
Do.	K	P	Coal tar
Do.	P	Connecticut avenue	do.
Do.	R	S	Asphalt

pairs to asphalt pavements to July 1, 1902—Continued.

Square yards.	Price per square yard.	Original cost.	Resurfaced.		Repairs—average annual cost per square yard.			Remarks.
			Year.	Cost per square yard.	Prior to resurfacing.	Since resurfacing.	Current year.	
10,553	\$0.59	\$5,721.00						
5,130	1.72	12,579.29						
14,090	.499	9,328.00						
2,974	3.20	9,515.00	1880	\$0.42	0	\$0.031	\$0.0054	
12,450	2.00	27,306.00			\$0.018		.052	
10,818	2.26	25,026.00			.031		.046	
12,525					.035		.066	
7,194	1.76	17,408.00		0	0	0	0	
1,000								
4,700								
2,314	3.20	7,406.00	1880	.94		.011	0	
6,713	3.20	21,482.00			.096		.002	
2,573	2.18	6,222.00		0	0	0	0	
4,847					.021		.009	
4,958	3.20	15,866.00	1902		.021		.006	Resurfaced, H to I.
10,603	3.20	33,929.00	1878	1.38		.021		
2,095	3.00	6,285.00	1894	.84		.011	.007	
1,765	1.98	5,552.00	1894		.047	0	.026	
1,874	2.00	6,154.00	1898	2.45	.037		.065	
2,946	2.00	10,430.00			.021		.063	
4,086	1.72	10,003.92						
1,100								
2,220								
1,065	3.20	3,506.00	1878	1.02		.024	.032	
4,896	2.05	10,466.00			.021		.036	
4,515	3.20	14,448.00	1880	1.15		.024	.075	
1,431	2.10	3,286.00						
7,584	3.20	24,269.00	1878	1.54		.018		
			1881	.466		.032		
			1895	.29		.109		
			1897	1.06		.015	.0041	
1,764		4,600.00						In place of bituminous base.
3,130	2.25	10,796.00		0	0	0	.0024	
3,823	2.25	12,333.00		0	0	0	0	
3,206	2.00	6,413.00			.021		.037	
4,406	1.53			0	0	0	0	Widening.
227	1.68	9,514.00						
3,000								
3,154								
6,421	3.20	20,547.00	1878	1.50		.011	.052	
3,170	1.94	6,709.00						
3,726	2.394	8,915.00						
1,894	2.58	4,949.00						
2,409	2.06	5,198.00			.021		.054	
7,598	3.20	24,314.00	1878	1.20		.01		
			1891			.027		
			1895			.016	0	
5,274			1902	0	0	0	0	
1,066				0	0	0	0	
2,433								
5,579	3.20	17,853.00	1878	1.55		.019		
			1899	1.43		.077	.028	
981	1.46	1,486.00			.022		0	
1,349	1.92	2,707.00						
8,201	3.20	24,243.00	1880	.783	.015	.058		
			1894	.242				
			1896	.332		.054	.0009	
2,167	3.20	6,934.00	1878	1.385		.053		
1,995	1.20	5,607.00	1896	.284			0	
				0	0	0	0	Cobble base.

TABLE D.—*Descriptive list of street pavements and suburban roads*

Street.	From—	To—	Kind of pav or road
Twentieth, NW	S	Florida avenue	Cobble
Do.	Baltimore	Cincinnati	Asphalt blo
Twenty-first, NW	E	Virginia avenue	Macadam
Do.	E	Pennsylvania avenue	Coal tar
Do.	Pennsylvania avenue	K	Granite
Do.	K	Massachusetts avenue	Coal tar
Do.	Q	Hillyer place	Asphalt blo
Do.	Hillyer place	R	Coal tar
Do.	R	Florida avenue	Asphalt, B.I
Twenty-second, NW	New York avenue	Virginia avenue	Macadam
Do.	Virginia avenue	F	Asphalt, H.
Do.	F	G	Asphalt
Do.	G	Pennsylvania avenue	Coal tar
Do.	K	M	Asphalt, H.
Do.	M	O	Asphalt, B.I
Do.	O	P	do
Do.	P	Massachusetts avenue	Asphalt, H.
Do.	Massachusetts avenue	R	do
Do.	Cincinnati	Frankfort	Macadam
Twenty-third, NW	Virginia avenue	E	Asphalt, H.
Do.	F	G	Cobble
Do.	G	I	Asphalt
Do.	I	Pennsylvania avenue	do
Do.	K	L	Asphalt blo
Do.	L	M	Asphalt, H.
Twenty-fourth, NW	G	Pennsylvania avenue	Cobble
Do.	Pennsylvania avenue	M	Asphalt, H.
Do.	Emporia	Frankfort	Macadam
Twenty-fifth, NW	H	K	Asphalt, H.
Do.	K	Pennsylvania avenue	Asphalt, B.I
Do.	Pennsylvania avenue	M	do
Twenty-sixth, NW	G	K	Cobble
Do.	K	Pennsylvania avenue	Granite
Do.	Pennsylvania avenue	M	Coal tar
Twenty-seventh, NW	M	P	Macadam
Twenty-eighth, NW	M	Dumbarton	Asphalt
Do.	Dumbarton	P	do
Do.	P	Q	Asphalt, B.I
Do.	Q	U	Macadam
Twenty-ninth, NW	K	M	Cobble
Do.	M	N	Granite
Do.	N	P	Asphalt
Do.	P	Q	Asphalt, B.I
Do.	Q	U	Macadam
Thirtieth, NW	Virginia avenue	K	Asphalt, H.
Do.	K	Chesapeake and Ohio Canal	Cobble
Do.	Chesapeake and Ohio Canal	M	Asphalt, H.
Do.	M	N	Granite
Do.	N	P	Asphalt, H.
Do.	P	Q	Asphalt, B.I
Do.	Q	U	Granite
Thirty-first, NW	K	M	Coal tar
Do.	M	N	Granite
Do.	N	P	Asphalt
Do.	P	U	(Asphalt, H.) Granite
Thirty-second, NW	K	M	Cobble
Do.	M	P	Granite
Do.	M	N	do
Do.	P	V	Asphalt blo
Do.	V	Thirty-fourth	Cobble

pairs to asphalt pavements to July 1, 1902—Continued.

Square yards.	Price per square yard.	Original cost.	Resurfaced.		Repairs—average annual cost per square yard.			Remarks.
			Year.	Cost per square yard.	Prior to resurfacing.	Since resurfacing.	Current year.	
900	\$0.70	\$630.00						Permit work.
845	1.77							
1,460								
6,101	3.20	19,524.00	1878	\$1.57		\$0.022		
1,365	1.92	2,616.00	1899	1.57		.031	\$0.004	
10,892	3.20	34,854.00	1891	1.21	\$0.019		.0046	Cobble base.
956			1902					
988	1.98	2,708.00			.052		.019	
1,483	2.00	5,190.00			.008		.005	
3,572								
884	1.76	2,215.00		0	0	0	0	Cobble base.
1,406	1.20	3,532.00		0	0	0	0	
4,641	3.20	14,851.00	1894	.907	.02	.05	0	
2,852	2.25	6,720.00	1900		.015		.015	
3,894	2.00				.005		.07	
1,586	2.00	4,862.00			.014		.066	4-inch base. Do.
2,668	1.94	6,483.00		0	0	0	0	
2,128	1.94	4,500.00		0	0	0	0	
4,050								
1,814	1.78	4,208.00		0	0	0	0	
1,108	.70							Cobble base. In place of asphalt block.
2,539	1.72	7,126.74						
1,425	1.20	3,347.00		0	0	0	0	
1,587	2.10	1,335.00						
1,800	1.77	4,309.00		0	0	0	0	
5,192	.70	3,635.00						On asphalt block.
2,456	1.78	6,418.00		0	0	0	0	
1,200								
3,739	1.54	9,129.00		0	0	0	0	
1,163	2.00	4,146.00		0	.008	0	.036	
1,683	2.00	5,972.00		0	.006	0	.012	Do.
5,042	.70	3,529.00						
1,690	2.48	4,206.00						
919	2.67	2,454.00			.023		.018	
4,100		5,867.00						
2,879	1.10			0	0	0	0	On asphalt block.
1,551	1.96	11,200.00		0	0	0	0	
1,474		8,737.00		0	0	0	0	
2,350		1,080.00						
2,919								
1,885	2.46	4,727.00						Do.
2,966				0	0	0	0	
1,261	2.00	3,381.00		0	0	0	0	
2,300								
1,617	.70	1,132.00						
1,116	1.76	2,651.00		0	0	0	0	Do.
2,121	2.15	4,425.00						
2,932	2.23	7,961.00			.045		.076	
1,282	2.00	3,515.00			.032		.008	
2,746		10,204.00						
1,300	1.98	5,514.00			.011		0	Do.
1,742	1.81	3,562.00						
3,338		4,312.00						
1,832	2.26				.009		.035	
3,295								
3,000								Widening. In place of cobble.
6,202	2.15	13,065.00						
561		2,620.00						
3,305	1.77	8,039.96						
1,825								

TABLE D.—*Descriptive list of street pavements and sub*

Street.	From—	To—	Kind of pav or roadw
Thirty-second, NW	Thirty-fourth	Thirty-fifth	Macadam
Do.	Thirty-fifth	Tunlaw road	Granite
Thirty-third, NW	K	M	Cobble
Do.	M	N	Asphalt, B. I
Do.	N	P	Asphalt, H. I
Do.	P	Thirty-second	Asphalt, B. I
Thirty-fourth, NW	M	N	do
Do.	N	P	do
Do.	P	R	do
Do.	R	Thirty-second	Macadam
Thirty-fifth, NW	M	Prospect	Cobble
Do.	Prospect	N	Asphalt, B. B
Do.	N	P	Coal tar
Do.	P	Q	do
Do.	Q	U	Asphalt, B. B
Do.	U	Tennallytown road	Asphalt, H. I
Thirty-sixth, NW	Prospect	O	Asphalt, B. B
Do.	O	P	Asphalt, H. I

NOTE.—H. B.=hydraulic base; B. B.=bituminous base.

pairs to asphalt pavements to July 1, 1902—Continued.

Square yards.	Price per square yard.	Original cost.	Resurfaced.		Repairs—Average annual cost per square yard.			Remarks.
			Year.	Cost per square yard.	Prior to resurfacing.	Since resurfacing.	Current year.	
3,500								
6,076		\$24,075.00						
1,540	\$2.00	5,800.00		0	0	0	0	
2,050	2.27	4,745.00			\$0.075		\$0.08	
4,675	2.00	9,764.00			.0008			
1,860	2.00	4,958.00		0	0	0		
2,109	2.00	7,927.00		0	0	0	0	
2,264	2.00	8,494.00		0	0	0	0	
6,570		8,984.00						
850								
1,017	2.00	3,346.00		0	0	0	0	
2,929	1.97	8,164.00			.01		.046	
1,558	1.97	5,305.00	1901	\$1.86	.068		0	
5,749	2.00	18,563.00			.004		.036	
6,009	2.25	18,242.00		0	0	0	.042	
2,368	2.00	7,994.00		0	0	0	0	
707	1.78	2,063.00		0	0	0	0	

1

2

3

4

5

ets and avenues for 3

HWEST SECTION.

urb ed.	Straight curb reset.	Circular curb reset.	Straig curb	Name of contractor.
ft.	Lin. ft.	Lin. ft.	Lin. ft.	
94.44			689.	Warner-Quinlan Paving Co.
797.72	28.25		825.	Do.
273.35			1,595.	Do.
86.71	60.74		1,523.	Do.
1,074.22	271.41		889.	Do.
221.22			294.	Do.

HWEST SECTION.

1,426.06	214.
2,176.42	414
	Warner-Quinlan Paving Co.
	Do.

HEAST SECTION.

192.67				Warner-Quinlan Pavin., Co.
1,036.62	78.70	702.		Do.
	23.15	407.		Do.
2,290.90		293.		Washington Asphalt Block and Tile Co.
14.36		1,181.		Do.
				Cranford Paving Co.

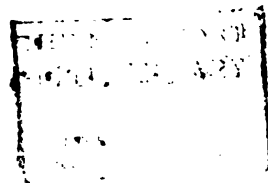
HEAST SECTION.

930.30	56.90	1,560.	W. F. Brenizer.
			Warner-Quinlan Paving Co.
206.59		2,496.	Do.
			Washington Asphalt Block and Tile Co.
			Cranford Paving Co.
			Matthew Myers.

ETOWN SECTION.

20	2,811.62	32.96	318.	Washington Asphalt Block and Tile Co.
----	----------	-------	------	---------------------------------------

end of asphalt block pavement.  
1901.



# roads and suburban s

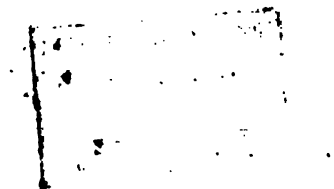
work.

	Old curb re- moved.	Straight curb reset.	Circular curb reset.	total cost of work.	Name of contractor.
	<i>Lin. ft.</i>	<i>Lin. ft.</i>	<i>Lin. ft.</i>		
8.	5.70	5.86		\$2,584.05	Washington Asphalt Block and Tile Co.
0	497.50	34.64		4,283.32	Do.
				9,689.32	Killeen & Ball.
4	60	15.96	9.49	3,164.22	Warner-Quinlan Paving Co.
2	30	18.80		2,173.66	Carmody & Hough.
				8,620.89	Washington Asphalt Block and Tile Co.
				2,868.81	Warner-Quinlan Paving Co.
	13	27.75		5,730.28	Carmody & Hough.
				2,825.54	Warner-Quinlan Paving Co.
				9,578.57	Carmody & Hough.
		295.60		4,741.13	G. B. Mullen.
				4,931.32	Warner-Quinlan Paving Co.
				1,929.41	Carmody & Hough.
				4,791.09	Huidekoper-Blundon, Talty, and day labor.
				1,916.61	W. H. H. Allen.
				4,466.02	Carmody & Hough.
				985.74	Andrew Gleason.
0	1,378	6.55	9.42	9,615.39	Colburn Paving Co.
				8,810.98	Warner-Quinlan Paving Co.
		423.50		2,875.57	M. F. Talty.
				8,778.10	Carmody & Hough.
		2,154.74		4,724.27	John Jacoby.
				20,131.57	W. L. Swormstedt.
					Carmody & Hough.
					Warner-Quinlan Paving Co.

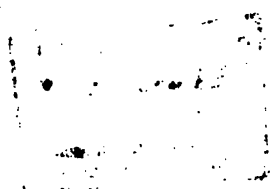
\$80 for inspection included.

## Paving roadways und

19,155.29 Washington Asphalt Block and Tile Co.







1

Work of street paving and repairs chargeable to street railroads for year ended June 30, 1962.

Locality.	Amount.	Locality.	Amount.
<b>PROPOLITAN.</b>		<b>COLUMBIA—continued.</b>	
street, Thirteenth to	\$267.43	Minor repair:	
V., K to L	2,828.19	Massachusetts avenue NW.,	
V., P to Florida avenue	1.82	Fourth to Seventh	\$105.54
V., T to K	25.93	H, NE., First to Fifteenth	28.67
Thirteenth to Vermont	7.66	H, NW., First to Third	22.42
Half, SW., Missouri	.42	New York avenue NW., Tenth	43.85
o Maryland avenue	104.22	to Thirteenth	4.55
at avenue and S, NW	1.55	Ninth and K, NW	4.55
and O, NW	1.37	H, NE., North Capitol to First	7.28
h, NW., N to P	5.46	New York avenue, Tenth to	
n, Twenty-eighth to		Twelfth	4.55
second	1.30	Total	1,449.97
V., G to New York ave-	20.93		
F, NW	1.82	<b>ANACOSTIA AND POTOMAC RIVER.</b>	
d Indiana avenue NW	21.84	Paving space occupied by aban-	
V., Massachusetts ave-	35.49	doned tracks:	
h, NW., F to New York	10.01	Maryland avenue SW., Third to	
at avenue, K to Dupont	11.50	Four-and-a-half	1,788.48
V., E to K	8.19	O, NW., Fourth to Eleventh	7,467.01
avenue and D, NW	6.87	P, NW., Fourth to Eleventh	7,213.09
East Capitol to B	18.20	Fourth, NW., G to K	10,165.81
inth to Fourteenth	18.20	First, SW., and Maryland avenue	860.23
fteenth to Seventeenth	38.22	Pennsylvania avenue SE.,	
New York avenue to	28.39	Twelfth to Thirteenth	387.10
th, NW., I to K	1.80	Minor repairs:	
at avenue, K to M	40.00	Eleventh and I, NW	9.88
h, NW., N to O	2.73	Elm, Third to Fourth, and Third	
	3,507.10	to Spruce	35.46
		Fourteenth, NW., Pennsylvania	
		avenue to B	6.37
		E, NW., Ninth to Eleventh	2.73
		First, Pennsylvania avenue to	
		Maryland avenue	4.55
		Fourteenth and Pennsylvania	
		avenue NW	3.64
		Eleventh and H and Eleventh	
		and I, NW	6.37
		Eleventh and G and Eleventh	
		and Massachusetts avenue	9.10
		Fifth and G, SE	14.27
		Total	27,909.09
<b>RAIL TRACTION.</b>		<b>CITY AND SUBURBAN.</b>	
d Maryland avenue	421.50	North Capitol, H to I	150.59
avenue SE., between		North Capitol, I to K	144.45
Thirteenth	15.78	C, NW., First to New Jersey avenue	42.35
Seventeenth to Eight-		Minor repairs:	
ridge to Thirty-first	8.64	G, NW., Second to Fourth	1.36
xth, NW., Pennsylva-	50.32	Sixth, NW., and Pennsylvania	
ue to M	10.30	avenue	18.49
7., Pennsylvania ave-	1.82	New Jersey avenue and G, NW	10.92
aryland avenue	7.28	Fifth and K and Fifth and L, NW	2.73
and V, NW		Florida avenue and Eckington	
nia avenue NW., Sev-	12.74	place	2.73
teenth	38.22	R, NE., Second to Third	1.41
Eighteenth	.91	G, NW., North Capitol to New	
and Rock Creek bridge	4.55	York avenue	93.40
avenue	10.32	D, NE., Maryland avenue to Ninth	5.45
omas Circle	7.28	G, NW., Second to Fourth	7.28
ashington Circle		North Capital and I	3.64
nia avenue NW., Twen-	37.23	G, NW., Seventh to Ninth	.91
Twenty-sixth		Fifth and Massachusetts avenue	10.92
	627.58	North Capital and K and North	
		Capital and New York avenue	21.84
		Tenth and G, NW	3.64
		Total	522.12
<b>AND TENNALLYTOWN.</b>			
and M, NW	3.64		
<b>COLUMBIA.</b>			
Maryland avenue, Fif-			
H	1,233.61		

1. The first part of the document is a list of names and addresses.

Work done by day labor under appropriation of "Current repairs to streets, avenues, and alleys," from July 1, 1901, to June 30, 1902.

laid	square yards	2,575
relaid	do	21,964
aved	do	966.83
spaved	do	2,282
repaved	do	1,569
aved	do	378.50
repaved	do	2,783.25
	do	10,222
	linear feet	128.63
	do	1,987.35
	do	682.50
	do	4,012
	square yards	2,605
walk relaid	do	1,897
k	do	827.57
	cubic yards	12,964.50
	square yards	5,818
	square yards	\$29,166.02
		1,625.20
		29,791.22

TABLE I.

Job No.	Location.	For whom done.	Grading.	Cement sidewalk.	Curbs.
			Cu. yds.	Sq. yds.	Lin. ft.
2000	East side Fourth street, between South and Central avenue.	John T. Larcombe	165		
2001	212 C street SW	Watts Bros	4		
2002	West side Murray place, between B and C streets.	Richard Knight Washington Loan and Trust Co.		69.66 136.39	
2003	113 to 121 U street NW	T. M. Haislip		74.89	
2004	1318 and 1320 B street NE	Daly Bartholomew		48.53	10
2005	South side C street, between Third and Four-and-a-half NW.	Geo. J. Johnson		25.34	2
2007	318 Indiana avenue NW	Wm. Birney		25.38	5
2008	535 and 537 Eighth street SE	H. I. Meader		80.57	
2009	625 Eighth street SE	Eugene Schwab		43.99	
2010	1801 Massachusetts avenue	Chas. A. Langley		471.93	5
2011	407 Tenth street NW	Thos. Walsh		63.55	
2012	Alley, square 254	Washington Post Co.	15		
2013	Alley, block 5, West Eckington	Geo. Truesdell	80		
2014	511 A street NE	A. D. Hazen	4		
2015	North side U street, between North Capitol and First NW.	David Moore and J. F. Barbour, trustees.	445	7	3
2016	East side Lincoln avenue, front lot 27, block 4, and lots 35 to 40, block 5.	Geo. Truesdell		215.88	
2017	South side G street, between Fourteenth and Fifteenth SE., and north side Georgia avenue, between Fourteenth and Fifteenth.	Thos. H. Pickford		520.15	30
2018	1702 Nineteenth street NW	Arnold H. Hord		21.57	
2019	216 A street NE	W. H. Marlow	3		
2020	Southeast corner Thirteenth and F streets NE.	Ed. I. Lanahan		105.99	
2021	Alley, block 3, Cliffbourne	E. J. Stellwagen	123		
2022	Southeast corner Twelfth and V streets NW.	A. B. Willis	2		
2024	Southern Railway, Thirteenth and E streets NW.	Southern Rwy. Co.		204.18	6
2025	425 Tenth street NW	James M. Johnston		49.81	
2026	409 Fifteenth street NW	D. E. McComb		17.12	
2027	1739 N street NW	Chas. A. Langley		36.22	
2028	Fifth street NE., between E and F	Washington Brewery Co.			
2029	533 Eighth street SE	Louis Schneber		39.14	
2030	1817 H street NW	John S. Larcombe		25.10	
2031	1527 S street NW	J. E. Bates		18.14	
2032	101 and 103 Fifth street NE	J. S. L. Rodrick		60.66	
2033	107 Fifth street NE	M. A. Austin		18.55	
2034	105 Fifth street NE	James H. Harris		19.23	
2035	1130 Fifth street NW	W. H. Black		20.76	
2036	1122 Fifth street NW	John F. Schaefer		20.16	
2037	Brookland M. E. Church, corner Tenth and Frankfort streets.	Rev. J. H. Hyatt		100.46	
2038	1432 Welling place	C. E. West		20.24	
2039	Southeast corner Nineteenth and N streets NW.	Chas. A. Langley	5		4
2040	Northwest corner Fourteenth and H streets NW.	Z. D. Blackiston		39.20	2
2041	15 and 17 Third street NE	Wm. H. Henning		47.84	
2042	West side Fifteenth street SE., lots 52 and 53, square 1058.	S. L. Phillips		139.61	
2043	Rear 1232 Four-and-a-half street SW	W. T. Otis			
2044	D street NW., between Fourteenth and Fifteenth.	W. T. Nailor	6		
2045	484 P street NW	Christiani Drug Co.		61.74	
2046	2038 Tenth street NW	Frank P. Burke			
2047	Corner Sixth and K streets NW	Wm. J. Zeh	3		
2048	Square 221, Lafayette Opera House	James R. Ash			
2049	47 Franklin street, Anacostia	T. J. Putnam			
2050	North side H street NW., between Nineteenth and Twentieth.	J. B. Lambie		63.61	
2051	1020 Ninth street NW	Dr. W. H. Heron		28.22	



TABLE I.—*Repaired*

Job No.	Location.	For whom done.	Grading.	Cement side-walk.	Curbs set.
			<i>Cu. yds.</i>	<i>Sq. yds.</i>	<i>Lin. ft.</i>
2052	1700 Corcoran street NW .....	M. R. Wiley .....		19.38	2
2053	1231 Maryland avenue NE .....	E. T. Kaiser .....			
2054	North side T street NW., from North Capitol to First.	Moore & Barbour .....	1,000		
2055	Lot 6, Gass subdivision, Whitney Avenue Mission.	Whitney Avenue Union Mission.		41.83	9
2056	2217 to 2231 Fifteenth street NW .....	F. W. McReynolds .....	8		
2057	1532 Park street NW .....	J. H. Cranford .....		27.63	
2058	1534 Park street NW .....	Margt. J. Cranford .....		42.81	
2059	929 P street NW .....	Dudley A. Denison .....		22.63	
2060	1503 Ninth street NW .....	J. Fred. Kelly .....		30.68	2
2062	1023 Thirty-first street NW .....	J. C. Johnson .....	6		12
2063	Lot 238, Fourteenth street and east 25 feet of lot 15, Park street, Mount Pleasant.	Chas. Schneider .....		91.72	
2064	202 to 205 and 206 to 215 U street NW .....	Geo. S. Cooper .....		234.13	
2065	East side Seventh and south side G street, square 455.	Wm. Schwing .....		301.51	
2066	South side Park street, east of lot 4, block 1, S. P. Brown's subdivision.	H. H. Parmenter .....		38.22	
2068	1545 Park street NW .....	D. S. Carl .....		30.57	
2069	10th and G streets NW .....	Woodward & Lothrop .....			
2070	Lot 191, south side U street NW., square 1282.	Mrs. Purcell .....		58.26	
2071	Lots 184-187, south side U street NW., square 1282.	C. C. Duncanson .....		78.04	
2072	Lots 172-174, south side U street NW., square 1282.	Annie E. Johnson .....		74.85	3
2073	1346 H street NE .....	C. H. Franzoni .....		61.06	
2074	1312 Fourteenth street NW .....	M. M. Parker .....	3		
2075	North side P street NW., Hamline M. E. Church.	O. M. Bryant .....		153.25	
2076	West side Thirtieth street, between Irving place and U street.	D. J. Cotter .....		28.96	
2077	1630 Twenty-ninth street NW .....	E. K. Fox .....		24.86	
2078	South side Dumbarton street, lots 1 and 2, square 1233.	Lloyd D. Smoot .....		47.34	62.6
2079	1130 Fourteenth street NW .....	Chas. H. Fishbaugh .....	3		
2080	South side R street, abutting lot 15, block 7, Kalorama Heights.	J. D. Patten .....		58.61	10
2081	South side R street, between Twenty-second and Sheridan circle.	J. H. Gore .....		28.87	5
2082	627 Louisiana avenue NW .....	R. P. Andrews .....		130.40	40
2083	36 to 42 Pierce street NW .....	James Robbins .....		45.68	
2084	1225-1227 Delaware avenue SW .....	W. S. Lofton .....		31.11	
2085	725 Twelfth street NW .....	L. E. Brenninger .....		19.29	29
2086	West side Thirty-sixth street NW., "House of Good Shepherd."	M. F. Talty .....			
2087	North side Florida avenue NE., at Fourteenth street.	T. L. Holbrook .....			8.3
2088	1513 and 1516 Caroline street NW .....	J. Ed. Chapman .....		29.53	
2089	1703 K street NW .....	Cranford Paving Co. .....			12
2090	1735 L street NW .....	do .....			
2091	922 O street NW .....	Wm. N. Henderson .....		27.16	
2092	West side Twenty-ninth street north of N, NW .....	Weaver Bros .....			10
2093	926 O street NW .....	Isabella E. Love .....		27.36	
2094	934 O street NW .....	J. P. Spindle .....		27.01	
2095	932 O street NW .....	A. N. Skinner .....		26.90	
2096	710 and 712 D street NW .....	Richardson & Burgess .....			
2098	North side W street NE., lots 1, 2, 3, block 41, Metropolis View.	F. W. Backus .....	20	78.98	
2100	1723 De Sales street .....	Florence Campbell .....		25.93	
2101	1706 Nineteenth street NW .....	A. A. Tunstall .....		23.44	
2102	1704 Nineteenth street NW .....	D. P. McCartney .....		23.36	
2103	442 M street NW .....	Richardson & Burgess .....		36.50	27
2104	Madison street, between Seventeenth and Eighteenth NW., lot 331.	Chas. Early .....		28.13	
2105	1321 M street NW .....	R. O. Holtzman .....		71.41	

Continued.

[illegible]

TABLE I.—Regular

Job No.	Location.	For whom done.	Grading.		Cement side-walk.	Curbs and set.
			Cu. yds.	Sq. yds.		
2106	South side Cincinnati street, lots 81 to 84, block 3, C. L. Bourne.	Kennedy & Davis		151.95		
2107	3184 to 3150 Q street NW	B. W. Walker & Son		142.19		15
2108	921 Pennsylvania avenue NW	B. H. Warner & Co		65.39		
2109	1719 N street NW	Chas. C. Langley		48.57		
2110	1446 Huntington place	Margaret L. Marsh		17.37		
2111	1448 Huntington place	Sarah E. Peck		15.08		
2112	1450 Huntington place	Chas. Loucks		17.37		
2113	Post-office building, Park street, Mount Pleasant.	C. M. Campbell		18.27		30
2114	1530 Fourteenth street NW	Geo. W. Parker		27.16		34
2115	642, 644, and 648 B street SE	P. Maloney	100			
2116	Liberty Baptist Church, south side E street NW, between Seventeenth and Eighteenth.	Rev. I. Toliver		51.81		45
2118	1701 K street NW	Thos. M. Seeds		278.82		30
2119	1312 Q street NW	Zach. M. Knott & Co.		31.73		
2120	Cincinnati street NW, between Nineteenth and Twentieth.	E. J. Stellwagen		375.65		
2121	Alley square 76, between C and D, Second and Third streets NE.	J. J. Healy	172			2
2122	1910 E street NW	Woodruff Manfg. Co	5			25
2123	North side V street NE, between Third and Fourth.	L. J. Woolen				
2127	South side V street, between North Capitol and Lincoln avenue.	Moore & Barbour	8,000			
2131	North side L street, between Twelfth and Thirteenth NW.	Mrs. C. G. Caughey		51.78		5
2132	East side Connecticut avenue, north of Randolph street.	E. J. Stellwagen	153	516.40		
2133	Both sides Randolph street, between Connecticut avenue and Pierce Mill road.	do	251	838.66		
2134	Both sides Quincy street, between Twenty-eighth street and Connecticut avenue.	do	3,332	1,076.40		
2138	744 to 786 Harvard street	E. E. Gaddis		267.28		
2139	Both sides Baltimore and Trumbull streets.	M. F. Talty	1,468			
2141	Lots 52, 53, 54, 55 Lanier Heights.	Guy H. Johnson	90	142.73		
2142	East side North Capitol street, between Albany and Detroit streets.	Joseph Paul		557.10		
2143	1650 to 1658 Sheridan avenue NW	C. W. King, jr		65.65		
2144	815 Seventh street SW	W. T. Smith		36.75		2
2145	Northeast corner Twenty-ninth and Q streets NW.	Emma J. Nourse		121.09		
2146	South side Ohio avenue, between Thirteenth and Thirteenth-and-a-half streets.	Barber & Ross	3			
2147	Eighteenth and Riggs streets NW	John N. Nolen		219.16		
2148	Southeast corner Eighth and I streets NW.	Saml. Bensinger	8			
2149	1443 and 1454 to 1466 Sheridan street	C. W. King, jr		126.19		
2150	2026 R street NW	E. H. Schenck		17.73		
2151	2228 Q street NW	R. A. Chester		32.01		
2152	2024 R street NW	E. Quigley Smith		20.56		
2153	1109 F street NW	R. W. Henderson		32.14		9
2154	3001 Kalorama avenue.	F. G. Eiker		2.01		
2155	South side Highland avenue, Cleveland Park.	H. A. Gillan	50	45.26		
2156	217 F street NW	Galloway & Son		54.25		3
2157	Lot 17, S. P. Brown's subdivision	Dani. Paul	8			
2158	1118 and 1124 Fifth street NW	S. E. & J. E. Roenthal		40.79		
2159	3128-3130 Fourteenth street NW	James F. Barbour		52.02		
2160	3130 Fourteenth street NW	do				
2161	3401-3403 S street NW	Ernest Dahle		45.40		16



TABLE I.—Regular

Job No.	Location.	For whom done.	Grading.	Cement sidewalk.	Curbs set.
			Cu. yds.	Sq. yds.	Lin. ft.
2162	Alley, square 67	Thos. F. Walsh	121		
2163	425 K street NW	Joseph F. Beck			
2164	2414 Pennsylvania avenue NW	J. D. Miles		53.20	3.60
2165	North side F street NE., lot 89-90, square 1028.	E. K. Fox		40.44	
2166	1447 Sheridan avenue	G. R. Baldwin		14.76	
2167	First street, New Jersey avenue, and H street NW	Paul J. Pelz		663.90	25
2168	1512 Eighth street NW	Eliz. Muhleman		21.71	
2169	1518 Eighth street NW	Fred. G. Schultz		17.55	
2170	1520 Eighth street NW	Jos. Brazzerol		17.61	
2171	1526 Eighth street NW	E. G. Smith		15.49	
2172	1338 New York avenue NW	John S. Larcombe		48.59	2
2173	826 Connecticut avenue NW	Cranford Paving Co.		58.67	34
2174	Sixth street NE., between H and I streets.	Rev. P. M. Rhineland.		95.89	
2175	Marlborough apartment house	Cranford Paving Co.		96.42	75
2176	East side Half street, between N and O streets SW.	Austin M. Cooper	28	51.70	
2177	631 to 639 Massachusetts avenue NW	E. B. Stumph		11.71	7.60
2178	Swann street NW., lots 71 to 76, square 177.	Geo. J. Easterday		63.96	
2179	East side Fifth street NE., between B and C streets NE.	J. Ed. Fowler		21.14	16.80
2180	1811 H street NW	Warren C. Beach		22.97	23.40
2181	Tenth and N street, lot 1, square 339	William Fletcher		279.21	7
2184	1600 Sheridan street NW	Chas. W. King, jr.		42.08	
2185	910 E street NW	D. A. Sanford		113.55	6
2186	1606 Fifteenth street NW	S. Dana Lincoln		22.68	
2187	1601 Fifth street NW	John H. Schluter	2		10
2188	South side Swann street, lot 46, square 177.	Geo. J. Easterday		60.07	
2190	720 Thirteenth street NW	L. E. Breuninger		74.92	
2191	North side Swann street, between Sixteenth street and New Hampshire avenue.	Thos. A. Gaither		50.86	
2192	North side U street, between Seventeenth street and Florida avenue.	Chas. W. King, jr.	60	647.18	
2193	Southeast corner Fifth and K streets NW.	B. F. Saul (agent)	2		
2194	1006 Massachusetts avenue NW	Ferd. T. Schneider		28.17	36.40
2195	1624 to 1628 Twenty-ninth street NW				
2196	West side Tennessee avenue, between East Capitol and B streets NE.	John A. Pearson		26	
2197	West side Tennessee avenue, between East Capitol and B streets NE., lots 43 and 44.	G. W. Strong		55	
2198	West side Tennessee avenue, between East Capitol and B streets NE., lot 49.	T. E. Kibley		28.51	
2199	West side Tennessee avenue, between East Capitol and B streets NE., lot 50.	Wm. Davis, jr.		31.51	
2200	West side Tennessee avenue, between East Capitol and B streets NE., lots 47 and 48.	J. P. Speecher		55.08	
2201	West side Tennessee avenue, between East Capitol and B streets NE., lot 42.	Lewis Mundheimer		27.61	
2202	Lots C. D. and E, square 551	Jacob Hauser		77.56	
2203	1374, 1376, and 1378 F street NE	S. B. Priest		57.82	
2204	231 Q street NW	Mrs. Carroll		18.26	
2205	Union Building, square 454	Union Building Co.		149.35	
2206	1612 Twenty-first street NW	H. A. Herbert		25.72	14.68
2207	2301 Brightwood avenue NW	Cranford Paving Co.		99.56	60
2208	Both sides Rhode Island avenue, between North Capitol and First streets NW.	Moore & Barbour		1,301.74	10.40
2214	Northwest corner First and Thomas streets NW.	W. R. Kemp	13		19.66

## OPERATIONS OF THE ENGINEER DEPARTMENT, D. C.

nit—Continued.

[illegible]

64 OPERATIONS OF THE ENGINEER DEPARTMENT, D. C.

TABLE I.—Regular

Job No.	Location.	For whom done.	Grading.	Cement sidewalk.	Curbs and set.
			<i>Cu. yds.</i>	<i>Sq. yds.</i>	<i>Lin. ft.</i>
2216	Wisconsin avenue, lots 282, 283, and 284, square 1300.	Wm. A. Custard.....		78.98	0
2217	Wisconsin avenue, lots 284 and 285, square 1300.	John W. Begley.....		50.79	45
2219	608 Tenth street SW.....	T. P. Stephenson.....		14.30	11
2220	608 Tenth street SW.....	E. B. Cranford.....		16.62	11
2221	612 Tenth street SW.....	W. A. Church.....		15.23	11
2222	616 Tenth street SW.....	M. T. McKenney.....		14.15	22.00
2224	North side T street NE, from North Capitol street to Lincoln avenue.	Moore & Barbour.....	150	207.49	11
2225	West side South Dakota avenue between Twenty-sixth street and Rhode Island avenue.	John M. Henderson.....		276.12	7.00
2226	Northeast corner Trenton avenue and Eighth street.	Herbert Lewis.....		63.20	6.20
2227	610 Tenth street SW.....	Wm. Gibson.....		15.04	11
2228	614 Tenth street SW.....	James O. R. Kuhn.....		16.42	11
2229	1426 Welling place.....	T. C. Noyes.....		15.73	
2230	1428 Welling place.....	I. L. Rogers.....		17.66	
2231	1430 Welling place.....	I. T. Hendricks.....		16.98	
2232	3153 to 3157 Q street NW.....	Cranford Paving Co.....		80.66	32.50
2233	North side T street, between Rhode Island avenue and North Capitol street.	Moore & Barbour.....		548.40	22.00
	Total.....		15,920	16,764.75	2,450.00

nit—Continued.

Curb set.			Vitrified block paved	As- phalt block paved	Cob- ble.	Flag laid.	Flag re- laid.	Brick side- walk paved.	Brick side- walk re- paved.	Gran- ite block.	As- phalt tile laid.	Cost.
20.	8 by 8.	Old										
.ft.	Lin. ft	Lin. ft	Sq. yds	Sq. yds	Sq. yds	Lin. ft	Lin. ft	Sq. yds	Sq. yds	Sq. yds	Sq. yds	
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	\$35.88
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	57.20
-----	-----	2.50	-----	-----	-----	-----	-----	-----	-----	-----	-----	16.42
-----	-----	2.50	-----	-----	-----	-----	-----	-----	-----	-----	-----	18.59
-----	-----	2.50	-----	-----	-----	-----	-----	-----	-----	-----	-----	17.28
52	-----	2.50	-----	-----	-----	-----	-----	-----	-----	-----	-----	18.12
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	636.12
-----	-----	6.10	-----	-----	-----	-----	-----	-----	-----	-----	-----	312.06
40	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	122.89
-----	-----	2.50	-----	-----	-----	-----	-----	-----	-----	-----	-----	17.12
-----	-----	2.50	-----	-----	-----	-----	-----	-----	-----	-----	-----	18.41
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	14.70
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	16.63
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	15.87
80	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	89.42
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	1,516.42
12	6,107.79	321.80	758.81	150	40.50	210	50	1,015.50	49	105	104	35,896.85

TABLE I.

Appropriation: Amount

Job No.	Location.	Grading	Cement side-walk.	Curb reset.	Curb set.		
					6 by 30.	8 by 8.	Old.
		Cu. yds.	Sq. yds.	Lin. ft.	Lin. ft.	Lin. ft.	Lin. ft.
301	Alleys in square 255, between Pennsylvania avenue and G. Fourteenth and Fifteenth streets.	86					
302	East side Fourth street NE., from South avenue south.	3					
303	North side D street NE., between Tennessee avenue and alley west.		229.92		279.90		
306	East side Fourteenth street, between D and Duncan streets NE.	60	229.08		213.93		
307	Alleys in square 151, north of Willard street.	730		30			
308	South side Erie street, from Fifth street to Brightwood avenue.	2,130	1,454.38				74
309	South side F street NE., from Fourteenth street east.		156.90		134		
309	Both sides Twentieth street, between Woodley road and south property line Cliff farm.						
311	South side Benning road, from Seventeenth to Nineteenth street.	45	687.77				
314	North side D street NW., between Eighth and Ninth streets.		140.84	3		98.10	
3015	West side Thirteenth street NW., between C and D streets.		437.02	27	364.60		
3016	East side Eighth street, between K and L streets NW.		402.60	384		10.85	9
3017	North side R street, between Thirteenth and Fourteenth streets NW.		308.54	7		626.14	
3018	East side School street, between Park and south property line S. P. Brown's subdivision.		106.47		312.20		
3019	Alleys north and south, block 21, Howard University.	224		25			
3020	West side Fourteenth street SE., from E to G.		324.73	40.90	514		
3021	Alleys in square 183.	316					
3022	Alley, square 342, between Massachusetts avenue and south line of 8-foot alley.	85					
3023	Alleys block 7, Bloomingdale.	874.50					
3024	Both sides Genesee street, between Piney Branch road and Brightwood avenue.	240	1,141.20				
3025	North side I street NW., between Sixth and Seventh streets.		224.45	75	9.42		18
3026	North side M street NW., between Twenty-third and Twenty-fourth streets.		379.08			389.02	8
3027	Both sides K street NW., between Fourth and Fifth streets.		2,131.85		113.40		4
3028	North side G street NW., between Tenth and Eleventh streets.		111.17			51.60	
3029	West side Eighth street SE., between E and G streets.		787.78				
3030	South side Pennsylvania avenue NW., between Third and Four-and-a-half streets.		1,281.40	461		59.38	
3031	North side Galena street, between Sixth and Seventh streets.		306.57				
3032	East side Sixth street, between Emporia and Galena streets.	66	443.15				
3033	South side Sheridan street, between Brightwood and Sherman avenues.		532.10	16			15
3034	North side M street, between Fifth and Sixth streets NW.	284.72		200			26



TABLE K.—Asse

Job No.	Location.	Grading.	Cement side-walk.	Curb reset.	Curb reset.		
					6 by 20.	8 by 8.	OS
		<i>Cu. yds.</i>	<i>Sq. yds.</i>	<i>Lin. ft.</i>	<i>Lin. ft.</i>	<i>Lin. ft.</i>	<i>Lin.</i>
3035	North side G street NW., between Fourteenth and Fifteenth streets		188				
3036	North side P street, between Fifth street and New Jersey avenue NW.		712.50				
3037	North side Bunker Hill road, between Ninth and Fort streets, and Fort street, between Bunker Hill road and Tenth street.	390					
3039	South side E street, between Thirteenth and Thirteenth-and-a-half streets NW		336.83	141			
3040	East side Thirteenth-and-a-half street, between D and E streets NW		319.44	92	148.60		
3041	West side Fifteenth street NW., between Rhode Island avenue and alley, north.		87.86			84.85	
3042	West side Third street, R street to Florida avenue, and east side Third street from Q street to Florida avenue		1,143.15	11.60			
3043	South side East Capitol street, between Second and Third streets.		570.55	343	27		
3045	Both sides Eighth street, from P to Q streets NW	25				933.28	
3048	Both sides M street, from Seventh to Ninth street NW				772.42		
3049	Both sides L street, from New Hampshire avenue to Twenty-fourth street.	30				1,213.50	
3051	Both sides O street, Ninth to Tenth street NW	25				1,072.77	
3052	Both sides P street, from New Jersey avenue to Eleventh street NW	150				5,094.11	
3063	South side East Capitol street, from Fourteenth to Fifteenth street					494.73	
3073	Both sides Erie street, from Ontario to Meridian avenue.				1,942.99		
3074	West side Erie street, from Champlain to Ontario avenues				318.7		
3075	West side Connecticut avenue, from Cincinnati street to Cathedral avenue					1,140.38	
3077	West side M street, Trinidad, from Twelfth street west.		527.09		814.20		
3078	West side Four-and-a-half street SW., between I and L streets.		1,461.73	591	36.20		
3079	Alley, square 614, between Q street, Florida avenue, and First street.	364		52			
3080	West side Tenth street NW., from D to F streets		1,287.43				
3081	South side New York avenue NW., from Twelfth to Thirteenth street, and Twelfth street east 138.80 feet, and south side I street, from Eleventh street west		1,172.21	21		801.50	
3082	Both sides Bladensburg road, from H street to Mount Olivet road				2,723.81		
3083	East side Twenty-second street NW., from R street to Decatur place.		270.21		234.42		
3084	South side Decatur place, from Twenty-second street to Florida avenue		407.20		432.50		



TABLE K.—Assests

Job No.	Location.	Grading.	Cement side-walk.	Curb reset.	Curb set.		
					6 by 20.	8 by 8.	12 by 12.
		<i>Cu. yds.</i>	<i>Sq. yds.</i>	<i>Lin. ft.</i>	<i>Lin. ft.</i>	<i>Lin. ft.</i>	<i>Lin.</i>
3085	South side Euclid place NW., between Fourteenth street and University place		281.49				
3086	South side E street NW., between Seventeenth and Eighteenth streets		640.38	147			
3087	West side P street NW., between Sixth and Marion streets		298.55				
3088	West side Thirteenth street NW., between Lamar place and Ly-decker avenue		729.68		795		
3089	South side T street, from North Capitol to First street			45.42	806.20		
3090	West side Fourteenth street, between G street and New York avenue NW		93.04			47.70	
3091	West side R street NW., between Fifteenth and Sixteenth streets		584.14	498			
3092	Both sides A street NE., from Fourth to Seventh streets					6.15	
3093	Both sides Park place NE., between Eleventh and Twelfth streets				632		
3094	South side South Carolina avenue, from Eleventh to Twelfth streets SE				307.52		
3095	North side U street NW., between First and Second streets		54	4.30			
3096	West side Twenty-ninth street, between Q and Road streets		124.89				
3097	Alleys in block 39, Columbia College grounds	793					
3098	Alleys, square 447, between Sixth and Seventh, N and O streets NW	887		47.60		60	
3099	Alley, square 1283, between Twenty-ninth and Thirtieth, Q and U streets NW	711					
3100	Alley, square 898, running east from Seventh street	100					
3101	Alley, square 1010, between B and C, Twelfth and Thirteenth streets NE	84					
3103	Alley, block 7, Kalorama Heights.	544		42	9.42		
3104	Both sides R street NW., from Connecticut avenue to Twenty-first street	25				732.60	
3105	West side Tenth street NW., from U street to Florida avenue		1,339.23				
3106	Both sides Adams Mill road, from Columbia road to Zoological Park			3		695.20	
3107	West side Ninth street, from Providence street to Bunker Hill road, and south side Bunker Hill road, from Ninth street to Baltimore and Ohio R. R.		332.40		445.50		
3108	Side side F street NW., from Sixth to Seventh streets		523.91	298			
3109	West side Sixth street NE., from L to M streets		479.47	206			467
3110	East side Sixth street NE., from K to M streets		764.95	761			278
3111	Both sides Kenesaw avenue from Fifteenth street extended, west.	190	956.01		985		
3112	East side Connecticut avenue NW., from De Sales to M street		307.36			184.05	
3113	Both sides Thirteenth street NE., from Maryland avenue to G street				237.53		
3114	West side Sixth street NE., from H to I street				300.82		
3118	East side Columbia road, from Florida to Wyoming avenue	825	808.05			14.30	13



TABLE K.—Assessment

Job No.	Location.	Grading.	Cement sidewalk.	Curb reset.	Curb set.		
					6 by 20.	8 by 8.	Old.
		Cu. yds.	Sq. yds.	Lin. ft.	Lin. ft.	Lin. ft.	Lin. ft.
3119	Both sides F street NE., from Maryland avenue to Thirteenth street .....				850		
3120	Both sides F street NE., from Fourteenth to Fifteenth street .....				631		
3121	Both sides Columbia road and Steuben street, from Sherman avenue to Thirteenth street .....					1,997.37	
3123	South side B street NE., from Second to Third street .....					341.22	
3124	North side S street NW., between Phelps place and Massachusetts avenue .....		1,708.34	68		747.55	
3125	South side T street NW., between North Capitol and First streets .....		807.67				
3126	North side Kramer street NE., between Sixteenth and Seventeenth streets .....		476.11		614.22		
3127	North side B street NE., between First and Second streets .....		628.31	627	6.28		
3128	North side Hartford street NE., between Twelfth and Thirteenth streets .....		310.20				
3130	East side Tenth street, between Providence and Fort streets .....		312.99				
3133	North side D street SE., from Fifteenth to Sixteenth street .....		159.71		204.20		
3136	Both sides Ninth street, from Erie to Flint street, Brightwood Park .....	299	461.98				12.00
3137	Alley, north half square 856, between Callan and L, Sixth and Seventh streets NE. ....	585		86.26			
3139	North side Providence street, from Fourteenth to Fifteenth street, Brookland .....		347.23				
3140	East side Adams Mill road north to Lanier avenue .....					236.32	
3141	East side Tenth street, between Frankfort and Hartford streets .....		119.99				
3143	Both sides Whitney avenue, from Brightwood avenue to Warder avenue .....	350	1,555.78	8	1,833.90		
3144	Both sides alleys, square 216 .....	198		54	9.42		
3147	Both sides B street NE., from Third to Fourth street .....					816.73	
3148	Both sides Cathedral avenue .....	2,114			7,549		
3149	South side Dover street, from Twelfth street to east line Metropolis View .....	104	279.53		409.90		
3150	15-foot alley in square 195 .....			12	17		
3152	North side Dover street, from Twelfth to Thirteenth street .....	399	410.94				
3153	West side Twelfth street, from Dover to Concord street .....		218.37		312.44		
3154	Both sides Detroit street, from Twelfth to Thirteenth street .....	9,000					
3155	South side Chicago street, from First to east line lot 76, square 720 .....		303.90	371	9.42		
3156	Both sides N street NW., from Fifth to Sixth street .....		554.37	499	28.26		13.60
3157	Both sides Nineteenth street NW., from R street to Florida avenue .....					2,074.70	
3158	North side M street NW., from Tenth to Eleventh street .....		201.89				
3159	North side M street NW., from Ninth to Tenth street .....		427.12	390			70



TABLE K.—Assessment

Job No.	Location.	Grading.	Cement side-walk.	Curb reset.	Curb set.		
					6 by 20.	8 by 8.	Old.
		<i>Cu. yds.</i>	<i>Sq. yds.</i>	<i>Lin. ft.</i>	<i>Lin. ft.</i>	<i>Lin. ft.</i>	<i>Lin. ft.</i>
3160	South side M street NW., from Eighth to Ninth street		226.12				
3161	East side Twenty-first street, from Virginia avenue to E street		226.66				
3162	West side Nineteenth street NW., from G to H street		478.88	3	425.90		
3163	West side Seventh street, from Q street to Rhode Island avenue NW		614.25	3		418.10	
3164	East side Fourteenth street, from T to U street		661.72			443.60	
3165	East side Sixth street NW., from M to N street		570.97				55
3166	East side Fifth street NW., from L to M street		545.79	470			64
3168	West side New Jersey avenue, between O and P streets NW					142.73	
3169	Both sides Gales street, between Sixteenth and Seventeenth streets			57.40			
3170	West side Fourteenth street, from F to alley between F and G streets						
3171	North side V street NW., between North Capitol and First streets			20	126		
3172	East side Sixth street SW., between H and I streets		279.22	226			29
3173	South side East Capitol street, between Fourteenth and Fifteenth streets		356.34				
3174	East side Eleventh street NW., between Little B and C streets		688.81	38			
3175	North side D street NW., front lots 1, 2, and 11.72 feet of 3, square 227		180.16	141			
3176	South side N street NW., between Vermont avenue and Thirteenth street		155.08			130.10	14.4
3177	North side F street, between Eighteenth and United States Government property, Seventeenth street		263.69			276.80	
3178	Alley, block 17, Le Droit Park						
3179	Alleys in square 186	138					
3180	14-foot alley, square 452	52					
3181	Alleys, square 1010, between B and C, Twelfth and Thirteenth streets NE	268					
3182	Alleys, square 1026	1,040					61
3183	Alley, square 855, between Morton and Orleans place and Sixth and Seventh streets	227		20			
3184	West side Fourteenth street NW., from L street north, square 215		282.04			235.40	2
3185	West side Fourteenth street NW., from north line lot 90, north to P street		1,458.82			930.76	
3186	East side Fourteenth street NW., from N to Rhode Island avenue		740.79			562.75	
3187	South side N street NW., from Seventeenth to Eighteenth street		430.00				
3189	West side Fourteenth street NW., between H and I streets		571.88			373.65	
3190	South side Florida avenue, between Seventeenth and V streets		123.81		121.60		65
3191	Alley in square 461	51		42	28.26		



TABLE K.—Assessment

Job No.	Location.	Grading.	Cement sidewalk.	Curb reset.	Curb set.		
					6 by 20.	8 by 8.	Old.
		Cu. yds.	Sq. yds.	Lin. ft.	Lin. ft.	Lin. ft.	Lin. ft.
3194	North side P street NW., between Ninth and Eleventh streets		665.10				13
3195	East side Tenth street, from U to Florida avenue		903.49				
3198	North side Meridian avenue NW., between Center street and east end Meridian avenue	32	216.21			360.20	8
3199	Both sides Gales street NE., between Fifteenth and Sixteenth streets	1,808.69					
3200	South side P street NW., between Seventh street and alley west of Seventh street		189.74	21			
3201	South side East Capitol street, between Thirteenth and Fourteenth streets		565.16	15		701	
3202	West side Tennessee avenue NE., from F to Fifteenth street			18.52	139.94		
3203	North side Bismarck street NE., between Brightwood and Sherman avenues		663.17			716.20	
3204	Alleys in square 962, between Tenth and Eleventh, D and E streets	1,188		112	18.84		
3205	Alleys in square 1065, between Fourteenth and Fifteenth, B and C streets NE	1,055					65.84
3206	15 and 30 foot alleys in square 761	193					
3210	South side Columbia road NW., between Eleventh and Thirteenth streets	116	98.09				
3211	South side Kramer street NE., from Sixteenth to Seventeenth street		250.81		613.40		
3212	Both sides Morton place NE., from Sixth to Seventh street	488					
3213	Both sides Orleans place NE., from Sixth to Seventh street	1,557					
3215	East side Columbia road, lot 7, Oak Lawn			11.45		78.65	
3217	Both sides Third street SW., from E to F street	16				646.21	
3218	Both sides E street SW., between Third and Fourth streets	30				1,257.23	
3219	Alley in square 159	46		15	9.42		
3220	Both sides L street SE., between Eighth and Ninth streets				602.28		
3221	Both sides Fourteenth street NE., between H street and Maryland avenue				508.70		
3222	East side Third street NE., between H and I streets	63					
3223	West side Kirby street NW., between New York avenue and N street				469		
3224	Both sides Sixteenth street NE., from Gales to Rosedale	30			541		
3225	Alleys in square 449	215					
3226	East and west 10-foot alley in square 672	296					
3227	Alleys in east half square 444	531		50	28.26		
3229	West side Fourteenth street SE., between G street and Pennsylvania avenue		187.98	28.80	245.20		
3233	South side Hartford street NE., between Tenth and Twelfth streets		277.71				
3234	South side S street NW., from Twenty-second to Phelps place	1,725					

t—Continued.

ified ck red.	Asphalt block paved.	Cobble.	Asphalt tile relaid.	Flag laid.	Flag relaid.	Brick sidewalk laid.	Brick sidewalk relaid.	Granite block laid.	Cost.
yds.	Sq. yds.	Sq. yds.	Sq. yds.	Lin. ft.	Lin. ft.	Sq. yds.	Sq. yds.	Sq. yds.	
									\$634.21
									856.55
									651.14
									1,700.72
									135.41
									1,263.83
		6					12		151.31
									1,546.99
	1,002	18			54		30		2,214.60
5				20			2		1,728.13
9									1,308.71
									123.45
									941.33
									a 99.00
									a 120.25
							9		98.68
									709.65
	1,065								1,490.37
									1,778.84
									620.00
									498.66
						100	14		108.81
									492.41
	3,066								540.04
									5,121.72
2	889.20								485.69
									1,732.46
									449.05
									812.01
									a 491.91

a Not completed.

TABLE K.—Assessment

Job No.	Location.	Grading.	Cement side-walk.	Curb reset.	Curb set.		
					6 by 20.	8 by 8.	Old.
		Cu. yds.	Sq. yds.	Lin. ft.	Lin. ft.	Lin. ft.	Lin. ft.
3237	South side O street NW., between Ninth and Tenth streets		107.96				
3238	South side O street NW., between North Capitol and First streets		282.16				
3239	Both sides First street SE., from M to N street				1,305		
3240	Alleys in block 2, Trinidad	2,200			94.84		
3241	Alleys in square 877, between E and G, Sixth and Seventh streets SE.	895					
3248	South side Rosedale street, between Sixteenth and east line lot 34		200.86		348.70		
3251	Alleys in block 3, Washington Heights	2,850					
3252	Alleys in square 972, between Pennsylvania avenue and D, Tenth and Eleventh streets	289		34.00			
3253	North side Harvard street NW., between Eleventh and Thirteenth streets		565.33	175.00	559.60		4
3255	West side Twentieth street, extended, from Columbia road to Wyoming avenue	200				112.75	
3257	South side Adams Mill road from Columbia road to Zoological Park		897.09				
3258	California avenue, near Eighteenth street, Washington Heights						
3259	North side California avenue NW., between Eighteenth street and Florida avenue		33.62				
3262	North and south side Highland avenue and south side Newark street, between Highland and Connecticut avenues	400	928.13				736
3263	Both sides Ingraham street, between Brightwood and Colorado avenues					1,812.10	
3264	Both sides Seaton street NW., from Seventeenth street to Florida avenue					818	
3269	Both sides Hanover street, from North Capitol street to alley				100.04	300.06	
3270	East side Half street SW., between N and O streets	32	237.25	11		422.38	
3271	South side U street, Florida avenue NW., between Seventeenth and Eighteenth streets		909.97				
3275	East side Tenth street NE., between Lansing and Providence streets		213.30				
3276	Both sides Swann street NW., between Sixteenth and Seventeenth streets		389.64			685.62	
3287	North side F street NE., from Elliott street westward		148.95				
3288	West side Fifteenth street NW., between Q and alley, north		119.98			127.61	
3013	Both sides Fourth street NW., from G to K streets	65				2,621.36	
4550	Both sides Elm street, from Third to Four-and-a-half streets					908.61	
5254	Both sides Connecticut avenue, between California and Wyoming avenues					748.03	
1502	Both sides Q street, from Third street to Florida avenue					1,614.63	
1507	Both sides First street NW., from Q street to Florida avenue					700.68	
1513	South side O street NW., from North Capitol to First street					853.72	
1708	South side E street SE., from Tenth to Eleventh street				2.50	244.96	

OPERATIONS OF THE ENGINEER DEPARTMENT, D. C. 79

—Continued.

Work done.	Asphalt block paved.	Cobble.	Asphalt tile relaid.	Flag laid.	Flag relaid.	Brick sidewalk laid.	Brick sidewalk relaid.	Granite block laid.	Cost.
Sq. yds.	Sq. yds.	Sq. yds.	Sq. yds.	Lin. ft.	Lin. ft.	Sq. yds.	Sq. yds.	Sq. yds.	
									\$100.88
									286.21
	2,380								1,894.43
	1,310								4,162.21
									2,831.70
									667.24
	1,070								3,129.47
	515								1,099.46
									1,209.24
									196.55
									953.62
									442.66
									33.28
									1,967.24
									2,004.06
									735.86
									518.41
									685.90
									849.81
									239.75
									1,047.64
									142.34
									262.63
									3,217.96
									1,039.28
									818.56
									1,798.27
									768.30
									964.01
									290.86

<sup>a</sup> Not completed.

TABLE K.—*Assessment*

Job No.	Location.	Grading.	Cement sidewalk.	Curb reset.	Curb set.		
					6 by 20.	8 by 8.	Old.
		<i>Cu. yds.</i>	<i>Sq. yds.</i>	<i>Lin. ft.</i>	<i>Lin. ft.</i>	<i>Lin. ft.</i>	<i>Lin. ft.</i>
1812	Both sides Fifth street NE., between D and F streets.	-----	-----	-----	1,281.87	4.23	-----
4450	Both sides Huntington place, from Fourteenth to University place.	-----	-----	-----	-----	917.43	-----
4660	Both sides Gales street NE., from Fifteenth to Seventeenth streets.	-----	-----	-----	2,238.75	-----	-----
1711	Both sides Fifth street SE., between G street and Virginia avenue.	-----	-----	-----	1,240.74	-----	-----
1811	Both sides G street NE., between First and Fourth streets.	-----	-----	-----	2,673.88	-----	-----
1814	West side Fifteenth street NE., from E to G and east side Fifteenth street from south line lot 44.	-----	-----	-----	234.57	1,461.34	-----
1815	Both sides East Capitol street, from Thirteenth to Fourteenth streets.	-----	-----	-----	10.90	755.48	-----
3292	North side V street NE., between Third and Fourth streets.	-----	207.46	-----	-----	-----	-----
3293	Sixth street NE., between H and I streets, lots 44, 45, 48.	-----	35.57	-----	-----	-----	-----
3294	South side Meridian avenue, between Center street and property line east.	68	218.05	-----	-----	370.75	-----
3295	East side Fourteenth street SE., between G street and Pennsylvania avenue.	-----	155.67	-----	236.62	-----	17.00
1511	Both sides Twenty-third street, between G and I streets NW.	-----	-----	-----	-----	1,566.37	-----
1509	East side Seventeenth street NW., T street to Florida avenue.	-----	-----	-----	-----	847.99	-----
	Total.....	42,856.91	56,548.74	8,264.34	42,828.31	45,772.05	2,314.14

k—Continued.

ified ck red.	Asphalt block paved.	Cobble.	Asphalt tile relaid.	Flag laid.	Flag relaid.	Brick sidewalk laid.	Brick sidewalk relaid.	Granite block laid.	Cost.
<i>yds.</i>	<i>Sq. yds.</i>	<i>Sq. yds.</i>	<i>Sq. yds.</i>	<i>Lin. ft.</i>	<i>Lin. ft.</i>	<i>Sq. yds.</i>	<i>Sq. yds.</i>	<i>Sq. yds.</i>	
									\$1,443.61
									1,053.80
									2,320.95
									1,865.08
									2,957.82
									1,974.42
									850.86
									236.22
									35.11
									668.61
									804.83
									1,851.51
									905.86
10	17,945.70	849	200	20	54	745	177		221,875.27

TABLE K.—Assessme

Job No.	Location.	Grading.	Cement side-walk.	Curb reset.	Curb set.		
					6 by 20.	8 by 8.	Old.
		<i>Cu. yds.</i>	<i>Sq. yds.</i>	<i>Lin. ft.</i>	<i>Lin. ft.</i>	<i>Lin. ft.</i>	<i>Lin. ft.</i>
3237	South side O street NW., between Ninth and Tenth streets		107.96				
3238	South side O street NW., between North Capitol and First streets		282.16				
3239	Both sides First street SE., from M to N street				1,365		
3240	Alleys in block 2, Trinidad	2,260			94.84		
3241	Alleys in square 877, between E and G, Sixth and Seventh streets SE.	895					
3248	South side Rosedale street, between Sixteenth and east line lot 34		260.86		348.70		
3251	Alleys in block 3, Washington Heights	2,850					
3252	Alleys in square 972, between Pennsylvania avenue and D, Tenth and Eleventh streets	289		34.00			
3253	North side Harvard street NW., between Eleventh and Thirteenth streets		565.33	175.00	559.60		4
3255	West side Twentieth street, extended, from Columbia road to Wyoming avenue	200				112.75	
3257	South side Adams Mill road from Columbia road to Zoological Park		897.69				
3258	California avenue, near Eighteenth street, Washington Heights						
3259	North side California avenue NW., between Eighteenth street and Florida avenue		33.62				
3262	North and south side Highland avenue and south side Newark street, between Highland and Connecticut avenues	400	928.13				75
3263	Both sides Ingraham street, between Brightwood and Colorado avenues					1,812.10	
3264	Both sides Seaton street NW., from Seventeenth street to Florida avenue					818	
3266	Both sides Hanover street, from North Capitol street to alley				190.94	300.06	
3270	East side Half street SW., between N and O streets	32	237.25	11		422.38	
3271	South side U street, Florida avenue NW., between Seventeenth and Eighteenth streets		909.37				
3275	East side Tenth street NE., between Lansing and Providence streets		213.30				
3276	Both sides Swann street NW., between Sixteenth and Seventeenth streets		389.64			635.62	
3287	North side F street NE., from Elliott street westward		148.95				
3288	West side Fifteenth street NW., between Q and alley, north		119.98			127.61	
3013	Both sides Fourth street NW., from G to K streets	65				2,621.26	
4550	Both sides Elm street, from Third to Four-and-a-half streets					908.61	
5254	Both sides Connecticut avenue, between California and Wyoming avenues					748.03	
1502	Both sides Q street, from Third street to Florida avenue					1,614.63	
1507	Both sides First street NW., from Q street to Florida avenue					700.68	
1513	South side O street NW., from North Capitol to First street					853.72	
1708	South side E street SE., from Tenth to Eleventh street				2.50	244.96	

—Continued.

finished block laid.	Asphalt block paved.	Cobble.	Asphalt tile relaid.	Flag laid.	Flag relaid.	Brick sidewalk laid.	Brick sidewalk relaid.	Granite block laid.	Cost.
nds.	Sq. yds.	Sq. yds.	Sq. yds.	Lin. ft.	Lin. ft.	Sq. yds.	Sq. yds.	Sq. yds.	
									\$100.88
									286.21
									1,394.43
	2,230								4,162.21
	1,310								2,831.70
									667.24
	1,070								3,129.47
	515								1,099.46
									1,269.24
									198.55
									953.62
									a 492.66
									33.28
									1,987.24
									2,004.06
									735.86
									518.41
									685.60
									849.81
									239.75
									1,047.64
									142.34
									262.63
									3,217.96
									1,039.28
									818.56
									1,798.27
									768.30
									984.01
									290.86

a Not completed.

TABLE M.—Miscellaneous work, 1902.

Job No.	Location.	Appropriation.	Grading.	Curb reset.	Cobble.	Curb set.			Terra-cotta pipe.	Cement sidewalk.	Vitrified brick road-way.	Asphalt block road-way.	Cost.
			Cu. yds.	Lin. ft.	Sq. yds.	6 by 20.	8 by 8.	Old.	Lin. ft.	Sq. yds.	Sq. yds.	Sq. yds.	
4801	Streets in Woodbridge	Streets of Woodbridge											\$100.20
5500	Retaining wall, Rock Creek	Retaining wall, Rock Creek											91.07
6000	Quarry road bridge, 1901	Quarry road bridge, 1901											5.62
6007	P street bridge across Rock Creek	Recont. of Metropolitan Rwy Co.											80.81
6008	M street bridge across Rock Creek	Recont. of Capital Rwy. Co.											17.13
6010	Bladensburg road.	Bladensburg Road, 1901.											86.66
6019	Engine house, Brookland.	Chemical engine company, Brookland.	225						150				55.67
6024	Quarry road bridge	Quarry road bridge, 1901			4		290.82			183	474		642.28
6029	Cathedral avenue, between Woodley road and Connecticut avenue	Cathedral avenue, 1901	1,600	120	1,188								1,214.96
6030	Engine house, Brookland	Chemical engine company, Brookland						135				150	376.20
6035	Massachusetts avenue arch.	Massachusetts avenue bridge.											304.32
6038	Quarry road bridge.	Quarry road bridge, 1901											85.03
6025	Block 3, University Heights	Emergency fund											28.50
6026	Cathedral avenue, between Cincinnati street and Woodley road.	Cathedral avenue, 1901	3,862										666.16
3701	W street, for fill over Massachusetts avenue arch.	Massachusetts avenue bridge											167.37
3702	Massachusetts avenue, west of Rock Creek.	do											26.00
3704	Massachusetts avenue east of T street.	do											3.75
3801	Connecticut avenue bridge.	Connecticut avenue bridge.											6.00
3802	do	do											84.62
	Total		5,687	120	1,192		290.82	135	210	183	474	150	4,071.94

TABLE N.—Whole cost of work.

Job No.	Location.	Depositors.	Curb set.		Vitrified brick roadway.	Cost.
			6 by 20	8 by 8		
			Lin. ft.	Lin. ft.	Sq. yds.	
6023	1801 Massachusetts avenue N.W.	Mrs. H. Wadsworth .....	9.42	9.42	.....	\$23.64
6033	Twelfth street, between E and F streets SW.	Southern Rwy. Co .....	.....	.....	.....	6.50
6036	3130 Fourteenth street N.W.	Fred. Warther .....	.....	.....	3	6.99
6037	Quarry Road bridge .....	Geisel Cons. Co. ....	.....	.....	.....	81.94
6040	Woodley Lane bridge .....	Thos. M. Bond .....	.....	.....	.....	9.95
6041	909 Seventh street NW .....	Chas. Xander .....	.....	.....	.....	1.50
3518	Anacostia bridge .....	Washington Traction and Electric Co. ....	.....	.....	.....	291.90
6032	Cincinnati street and Connecticut avenue.	H. P. Waggaman .....	.....	.....	.....	425.00
6034	Highland avenue .....	Mrs. Sarah M. Westcott.	.....	.....	.....	250.00
						1,097.42

TABLE O.—Number of square yards and cost charged for repairs to cuts made by plumbers and others in streets, avenues, and alleys during the fiscal year ended June 30, 1902.

Item No. 1 shows the number of cuts repaired for various plumbers.  
 Item No. 2 shows the number of cuts repaired and the cost thereof on "Whole cost" work to which 5 per cent is added for tools, clerk hire, etc., for the maintenance of the deposit and assessment fund, which fund is used to pay all accounts for labor, material, tools, etc., used in this class of work, and also includes the work done for gas, electric-light, and telephone companies, which is charged at the flat rates charged to plumbers.  
 Item No. 3 shows the number of cuts repaired on account of the sewer department and the cost of the same.  
 Item No. 4 shows the number of cuts repaired on account of the water department and the cost of the same.  
 Item No. 5 shows the number of cuts repaired and work done on account of other appropriations of the District and the cost of the same; also the cost of work charged against retents and appropriations of the General Government.

	Number.	Square yards.	Cost (amount charged).
Item No. 1.—Plumbers' cuts:			
Sheet asphalt .....	231	660.47	\$2,080.47
Granite block .....	118	452	610.20
Asphalt block .....	279	691.50	933.52
Vitrified block or brick .....	147	558	753.30
Cobblestone and rubble .....	191	416.32	166.53
Macadam .....	104	177	163.37
Granolithic .....	93	288.40	648.90
Brick sidewalks .....	933	8,761	1,867.37
	2,006	12,004.69	7,223.66
Item No. 2.—Washington Traction and Electric Co., gaslight companies, and other corporations .....			
	1,121	33,416.20	23,515.68
Item No. 3.—Various appropriations of the sewer department ..			
	496	12,261.39	18,320.39
Item No. 4.—Various appropriations of the water department ..			
	438	6,416.10	5,620.32
Item No. 5.—Various appropriations other than the above, including repairs to streets and roads, street lighting, electric department, improvements and repairs, assessment and permit work, etc .....			
	238	7,221.12	8,823.19
Total .....	4,389	71,319.50	62,903.24

TABLE P.—Grading streets, alleys, and roads, 1902.

Job No.	Location.	Gravel.	Grading.	Cost.
		Sq. yds.	Cu. yds.	
1900	Thirteenth street NE., between C and Emerson.....		2,376	\$64.39
1902	Sixteenth street NE., from A to B streets.....		312	51.00
1903	M and N streets, from Twelfth to Baltimore and Ohio R. R.		11,196	1,664.25
1907	Duncan street, from Fourteenth street east.....		452	61.00
1909	Block 20, Petworth.....		2,956	661.50
1909	Duncan street, between Fourteenth and Fifteenth.....	342	48	22.50
1913	C street, between Fifteenth and Seventeenth SE.....	1,472		100.00
1914	E street NE., between Twelfth and Fourteenth.....		7,290	1,004.13
1916	Warder avenue, between Whitney avenue and Rock Creek Channel road.....		1,294	62.25
1917	D street NE., between Fourteenth and Fifteenth streets.....		2,994	62.25
1918	Duncan street NE., between Fourteenth and Fifteenth.....		108	1.50
1919	E street NE., between Fourteenth and Fifteenth.....		723	124.12
1920	Hancock, McClellan, and Steuben streets.....		5,018	661.25
1923	Florida avenue west of Twenty-second street.....		764	97.00
1924	Madison street west of Thirty-fifth street.....		315	25.50
	Total.....			5,908.25

## REPORT OF THE SUPERINTENDENT OF COUNTY ROADS.

WASHINGTON, July 1, 1902.

SIR: I have the honor to submit report of the operations of the county road division during the fiscal year ended June 30, 1902.

MORRIS HACKER,  
Superintendent of Roads.

The COMPUTING ENGINEER,  
District of Columbia.

Respectfully transmitted to the Engineer Commissioner, District of Columbia, through Capt. H. C. Newcomer.

C. B. HUNT,  
Computing Engineer.

Expenditures for repairing county roads and suburban streets, fiscal year 1901-2.

Job No.	Location.	Cost.
SECTION I.		
4016	Blagden Mill road.....	\$3,614.15
4029	do.....	1,940.88
4038	Newark street.....	40.00
4057	Connecticut avenue.....	191.00
4070	Nebraska avenue.....	4,454.36
4071	Woodley road.....	997.17
4084	Military road.....	2,352.30
4080	Highland avenue.....	7,280.25
4102	Belt road.....	286.75
4115	Broad Branch road.....	638.73
	Dangerous holes and minor repairs.....	22,776.42
	Total.....	5,949.85
SECTION II.		
4008	Brightwood avenue, front of cemetery.....	64.75
4000	School street.....	969.69
4010	Vermillion street.....	1,858.47
4012	Ontario avenue.....	99.13
4013	Eighth street NW., north of Florida avenue.....	74.75
4014	Chesapeake street.....	63.90
4015	North Capitol street.....	1,181.07
4024	U street, North Capitol to First street.....	392.49
4025	V street, North Capitol to First street.....	1,413.51
4026	Utica street.....	146.40
4027	Central avenue.....	190.50

*Expenditures for repairing county roads and suburban streets, etc.—Continued.*

Job No.	Location.	Cost
SECTION II—continued.		
4028	S street, between First and Second.....	\$128.77
4031	Brightwood avenue.....	5,921.40
4039	Bunker Hill road.....	131.89
4041	Michigan avenue.....	600.92
4046	Whitney avenue.....	316.94
4056	Lincoln avenue.....	175.67
4086	Third and Oak streets.....	39.50
4087	Park street.....	132.07
4088	Seventh street, Metropolis View.....	39.13
4100	Blair Lee road.....	581.82
4118	Twenty-second street, between R and Decatur.....	243.03
4140	Paving alleyway, Whitney avenue.....	38.14
4190	Hancock, McClelland, and Steuben streets.....	138.00
4183	South side W street NW., between First and Second streets.....	40.84
4190	Warder avenue.....	28.75
4190	Florida avenue.....	94.50
4217	Thomas street.....	74.18
Dangerous holes and minor repairs.....		18,087.41
Total.....		25,637.10
SECTION III.		
4007	Baltimore street, Winthrop Heights.....	6.25
4017	Twelfth street, Brookland.....	601.73
4040	Tenth street, Brookland.....	138.56
4049	M street (Robt. Morris subdivision).....	65.25
4099	Twenty second street, Langdon.....	511.03
4110	Bunker Hill road.....	2,719.10
4132	Detroit street, Brookland.....	2,015.65
4167	Blair road.....	109.24
Dangerous holes and minor repairs.....		6,166.81
Total.....		11,016.09
SECTION IV.		
4011	Livingston road.....	301.49
4042	Bennings road.....	428.25
4045	Nichols avenue.....	1,091.75
4133	Morris road.....	294.77
4159	Cross road, west site for Good Hope school.....	49.00
4168	Wheeler road.....	171.90
Dangerous holes and minor repairs.....		2,337.76
Total.....		6,433.12

## RECAPITULATION.

Section I.....	\$38,726.27
Section II.....	25,637.10
Section III.....	11,016.09
Section IV.....	6,433.12
Total.....	71,812.58
Salaries.....	3,442.00
Hire of horse and buggy.....	313.00
Blacksmithing.....	518.63
Purchase of tools and water wagons.....	2,266.95
Purchase of cobble, gravel, pipe, cement, etc.....	994.22
Breaking stone and miscellaneous labor.....	651.31
Total.....	79,988.69
Amount of appropriation.....	80,000.00
Balance of appropriation.....	1.31

NOTE.—Section I is the territory west of Rock Creek; Section II is the territory between Rock Creek and Metropolitan Branch, Baltimore and Ohio Railroad; Section III is the territory between Metropolitan Branch, Baltimore and Ohio Railroad, and Anacostia road; Section IV is the territory south and east of Anacostia.

## REPORT OF THE ENGINEER OF BRIDGES.

WASHINGTON, D. C., July 1, 1902.

SIR: I have the honor to submit the following report for the fiscal year ended June 30, 1902:

The expenditures under "Ordinary care of bridges" were as follows:

Amount of appropriation .....	\$4,000.00
Salaries .....	3,870.64
Coal, oil, and contingencies .....	33.13
Paint purchased .....	93.60
Balance .....	2.63
Total .....	4,000.00

Keepers were stationed at the Aqueduct Bridge, across the Potomac, and the Pennsylvania avenue and Navy-Yard bridges, across the Eastern Branch. At the last-named structure the operation of the draw requires a keeper and helper, and at the other two the demands of the public convenience justify their retention.

The work of "Construction and repairs" is shown by the annexed table.

*Expenditures, "Construction and repair of bridges, 1902."*

Job No.	Bridge.	Character of work.	Cost.
3500	.....	Various bridges .....	\$25.22
3501	85	Construct culvert (Seventeenth and Lowell streets) .....	25.22
3502	.....	Various bridges .....	125.19
3503	35	Repair .....	8.54
3504	55	Relay floor (Anacostia Bridge) .....	3,432.17
3505	17	New joists and flooring .....	71.25
3506	61	do .....	70.47
3508	34	Paint railing .....	40.41
3509	.....	Various bridges .....	77.32
3514	1	New floor and joists (Chain Bridge) .....	3,614.55
3520	52	Rebuild masonry (Bennings road bridge) .....	222.04
3521	.....	Various bridges .....	45.00
3522	do	do .....	23.17
3523	36	New floor .....	107.45
3524	.....	Various bridges .....	103.25
3525	do	do .....	33.52
3527	do	do .....	1.06
3528	do	do .....	28.22
3531	do	do .....	46.41
3532	do	do .....	51.14
3533	do	do .....	104.67
3534	20	New floor .....	430.88
3535	6	New floor and joists .....	422.88
3536	.....	Various bridges .....	174.30
3537	31	Paint superstructure .....	45.25
3538	223	Rebuild culvert (Brightwood avenue, north of Xenia) .....	563.59
3539	.....	Various bridges .....	7.17
3541	64	Repair floor .....	74.46
3542	60	Repair .....	41.22
3543	84	Reconstruct joist and flooring .....	67.44
3545	.....	Various bridges .....	89.01
3546	do	do .....	119.28
3540	54	Lumber for new floor (now being delivered) .....	5,500.00
Total .....			16,546.26

The regular repairs consisted of painting the ironwork, removal of floors, and such minor repairs as were from time to time necessary. The structures, excepting the Anacostia Bridge (No. 55), are in a safe condition, requiring only such repairs as are due to their use.

The Anacostia Bridge (No. 55) has been structurally weak, and, since the employment of the heavy motor cars of the Anacostia and Potomac River Railway Company, particularly so.

The electric cars which now cross the bridge weigh, when empty, between 7 and 10 tons, and when loaded with people this load reaches a maximum of 17 tons. The bridge was not designed to carry such a heavy load. In addition, the draw is archaic, the bridge unsightly, much too narrow (the entire width of roadway being taken up with car track), and totally inadequate to meet the demands of public travel, in consequence of which I have the honor to recommend that it be replaced with

a modern structure of ample width. This recommendation has been made each year since 1887, and the conditions described in each of the several reports are to-day aggravated. The present bridge was constructed in 1875. Its condition is notoriously bad and worthy of serious consideration. The inadequacy of this bridge for vehicular travel is indicated by the following comparison of the number of vehicles crossing the three river bridges under my supervision, between the hours of 8 a. m. and 5 p. m. The vehicles were counted by the several bridge keepers each Saturday from April 1 to May 31, inclusive, and the numbers here tabulated are the mean of the counts.

Anacostia Bridge (vehicles, not including 160 electric cars).....	1,300
Aqueduct Bridge (vehicles, no cars).....	1,100
Pennsylvania avenue bridge (vehicles, no cars).....	200

Particular attention is called to the condition of the railings on the Anacostia Bridge, which are in very bad condition and are rapidly becoming unsafe. The cast-iron bases are badly rusted and cracked. The fence is largely held together with wire. Two cast-iron shoes are cracked, one so badly that I found it necessary to prop up the span (first span reckoning from the Washington side) with timber until a new casting can be purchased and placed. The bridge should be rebuilt; it can not be strengthened. I have to suggest that an appropriation of \$100,000 be requested to immediately begin the reconstruction of the bridge, with authority to contract for the completed structure under a limited total cost of \$300,000. If the bridge is not built next year it will be necessary to replace the present railing at an estimated cost of \$5,000.

The principal items of expenditure under the appropriation for the "Construction and repair of bridges" consisted in laying new floors on bridges No. 1 (Chain Bridge), No. 55 (Anacostia Bridge)—the timber was purchased from last year's appropriation—and the purchase of lumber for No. 54 (Pennsylvania avenue bridge across the Eastern Branch), amounting together to \$12,554.82.

From a cursory glance at the accompanying tabulation it is apparent that the appropriation of \$15,000 is not sufficient to repair the existing bridges. We find it necessary to delay repairs to the floors of all bridges until such time as they are approaching the danger limit.

A bridge floor should never be as rough as the paved roadways which approach it. Considerable complaint is lodged at this office on account of the excessive roughness which obtains at several of our bridges. Persons driving across them experience much discomfort and are practically forced to walk their horses drawing carriages and other light vehicles. The most serious point at issue, however, is the injury to the superstructures, which necessarily suffer on account of the heavy vibratory strains induced by the passage of heavy vehicles over the rough surface.

Attention is called to the police regulation which reads in part: "That no vehicle and its load which exceeds 6 tons shall be permitted to cross any bridge without a permit in writing from the Engineer Commissioner." This regulation is essential under the existing conditions. But it appears that in the case of bridges on main thoroughfares where heavy loads frequently cross in excess of that permitted by the regulations, such as the Rock Creek bridges, on the line of M and P streets, that the roadways should be amply strong to carry the heavier loads. The substructure and superstructure of the bridges are ample to carry a buckleplate-asphalt floor and to permit loads up to 15 tons to cross in safety. It appears poor economy to have the aforesaid bridges, which cost approximately \$100,000 each, with floors so structurally weak that one-half the value of the bridge is lost to the public use. The estimated cost of a first-class floor for the P street bridge is \$4,000 and of M street is \$5,500. Both estimates include the roadway between rails; also the sidewalks.

K street bridge, crossing Rock Creek, is structurally weak and will not permit of strengthening, but should be rebuilt as soon as possible. The estimated cost of reconstructing the K street bridge is \$20,000.

The three bridges which connect the city proper with Georgetown are deemed particularly important on account of the constantly increasing heavy travel from the water front. The cost of maintaining a concrete asphalt roadway and cement walks on the P street bridge is estimated at \$35 per annum and that of the present wooden ones at \$150 per annum. The cost of maintaining a concrete asphalt roadway and cement walks on the M street bridge is estimated at \$42 and that of the present wooden ones at \$235.

The principal bridge constructed during the fiscal year was the boulder-faced bridge across Rock Creek on the line of Beach drive in Rock Creek Park. The bridge was designed in the office under the direction of Capt. Lansing H. Beach

and Mr. William P. Richards. The total cost of the bridge was \$17,635.77, which was paid from the appropriation for the care and improvement of Rock Creek Park. The bridge was built of concrete, incasing 9 lattice girders, and was faced throughout with bowlder stones. The adoption of the bowlder facing was determined by the character of the stream and the natural surroundings of the site. The bridge is thought unique because of its large span for a bowlder bridge and also because of the size of the bowlders used. Reference is here made to the Engineering News of August 14, 1902, should the details of the construction of the bridge be of interest to this office at any future time. The bridge was built by Messrs. Talty & Allen, of this city, contract No. 3034.

The Massachusetts avenue bridge masonry was completed at a total cost of \$132,005.82, the work having been executed under two contracts. The first contract, with the Cranford Paving Company, contract No. 2626, amounted to \$20,248.76, and was completed December 24, 1900. The second contract, with the Brennan Construction Company, contract No. 2787, amounted to \$111,757.06, and was completed December 16, 1901.

Work of grading Massachusetts avenue west of Rock Creek is now being carried on by Cogan Brothers & Forschner. This work was begun January 4, 1902, and will be completed January 4, 1903. One hundred and thirty thousand cubic yards of earth have been placed over the arch. Since this contract was entered into Congress has appropriated \$10,000 for raising the grade of the roadway and wing walls of the culvert on the line of Massachusetts avenue across Rock Creek. The grade is to be raised 10 feet at the bridge and 10 feet at the circle. The Massachusetts avenue bridge balance at present is \$51,433.25. When the grading work is executed there will be a balance of about \$27,000, which will be ample to build the parapets and improve the roadway.

All the foundations for the Connecticut avenue bridge, from piers 2 to 9, inclusive, under Mr. Morison's plan, have been built up to about 3 feet of the springing line. The present balance for the Connecticut avenue bridge is \$61,907.36. No work toward the completion of this bridge has been done this summer, as there has been no authorization to enter into a contract for the finished bridge, and the question of the total cost of the work is still indeterminate. Before the work may be prosecuted further the kind of facing must be determined upon, as the total cost of the bridge is necessarily contingent upon the same. It is thought that \$200,000 should be appropriated for the coming year for the Connecticut avenue bridge in order to build the bridge up to the actual springing lines of the arches. The balance now on hand will complete the foundations for piers 1 and 10 and also the foundations of the two abutments and leave a balance of about \$40,000, which might properly be used in building one of the piers to the springing line.

Especial attention is called to the condition of the Anacostia Bridge and the K street bridge, and the inadequacy of the appropriation for "Construction and repair of bridges." There are at present 20 small wooden bridges, of small span, which should be replaced by masonry culverts. The insufficiency of the appropriation prevents the elimination of these timber structures, with a resultant loss to public economy.

An appropriation of \$25,000 for the "Construction and repair of bridges" is urgently needed, instead of the appropriation of \$15,000 made last year. This appropriation was reduced from \$20,000 to \$15,000 several years ago.

Respectfully submitted.

W. J. DOUGLAS,  
*Engineer of Bridges, District of Columbia.*

The COMPUTING ENGINEER, DISTRICT OF COLUMBIA.

Respectfully transmitted to the Engineer Commissioner, District of Columbia, through Capt. H. C. Newcomer.

C. B. HUNT,  
*Computing Engineer.*

## REPORT OF THE SURVEYOR.

WASHINGTON, D. C., July 15, 1902.

SIR: Pursuant to your instructions of July 1 last, I have the honor to make the following report of the operations of the surveyor's office during the fiscal year ended June 30, 1902, and also the following suggestions as to means of improving the efficiency of the same:

The year has been a very busy one, especially during the months of March,

April, and May, the recent changes in the building regulations being responsible for a considerable part of the work. The requirement of an official plat of each lot to be used as the site of a building has caused the making of 749 plats of single lots or groups of lots. The requirement of a survey in all cases to verify the location of new walls in process of erection has caused the making of 282 surveys. As the new regulations went into effect March 1, complete annual figures are not attainable as to the effect in the number of plats and surveys, but enough is known to amply justify the adoption of these two requirements. Probably 15 cases of errors of builders in location of party walls were discovered before it became difficult to correct the error. The effect is excellent; it is to see that the permit granted is adhered to perfectly in the matter of location and that the adjoining land, including public streets, etc., is protected from encroachment. In addition, the system provides very considerable protection to this office, which has now an opportunity to correctly reset points of survey which during building operations may be jammed out of true position, with the natural result as to walls built thereupon.

In connection with the plan submitted some months ago by this office to assist the assessor in the definite designation of all parcels of suburban land, it is deemed proper in this report to show the constantly increasing necessity for a series of plats, showing constantly, up to date, the subdivisive condition of each block of the city. These can be made up from the original papers of subdivision as they come in day by day in pencil, on a basis of the condition at any one time, drawn in ink. This will, of course, not include parcels cut out by metes and bounds by deeds, but it will be a step in the proper direction, and as far as is now possible to go, in the absence of legislation requiring the registration in the surveyor's office of a number for each parcel so cut out by deed, before the recording of said deed. I regard this, under our system, as the only means of supplying the assessor's office with the designations he needs, and the plan should include the whole District. I do not believe there is any real difficulty in carrying out such a plan, once having the plats prepared as suggested. At present, in the city at least, it is impossible to get on one sheet the subdivisive condition of any square, several record books having to contribute to the result. The need of this reform is felt chiefly by the various departments of the municipal administration, whenever the opening or condemnation of an alley is desired, and in any case where the true relation of a lot or group of lots is desired, in reference to other lots or an alley, etc.

The incessant demand upon the office force for the most imperative current work has prevented any beginning on this comprehensive platting so far, but it will be undertaken whenever opportunity is afforded. In this connection, I think it would be conducive to the public interest to permit the preparation without cost to owners of plats of subdivision in all cases of "part lots," which are carried on the assessor's books as such, or which appear therein according to the description by metes and bounds. I refer at this time specifically to property in the city proper, or in recorded subdivisions of suburban land. The loss of revenue in fees, which would result, ought not to weigh against the benefit resulting to the various District offices in the simplification of records and accounts. At present, except in the ordinary course of business in preparation for building, but little is done toward ridding the records of these indefinite designations. Under an order of the Commissioners, dated October 7, 1896, the assessor's office issues a blank form, to be signed by the owner in exceptionally troublesome cases, showing the willingness of the owner to sign a subdivision in regular form, the latter to be free of expense. This form is availed of at the instance of the surveyor and of the inspector of buildings, in frequent cases where by doing so objections to subdivision may be overcome, and the question naturally arises, "Why not place all such cases on the same footing?" It is thought that an order remitting all fees in such cases should be widely made known through the press, and owners should be encouraged and invited to avail themselves of such facilities. This should also include cases of duplication of designation. There are now some 1,300 cases of duplication of designation, and even some cases of triplication, in the same square, leading to all sorts of errors and confusion.

This office has steadfastly held to the view that the existing act of Congress, which was intended to secure definiteness in all property designations in the District, is impracticable of execution, on the well-known principle that the owner's consent is essential to a change of designation of his property. It is believed that the assessor's office is fully in accord with this office on this question. No new legislation is needed to cure existing cases, except sufficient provision in the appropriation bill for the additional office force to make up the papers for action in the ordinary manner, in the case of all existing duplications and "part lots."

The resurvey of the Barry farm is not yet completed because of interruption; the work of current surveys of suburban lots for immediate building purposes and the surveys of large tracts being considered improper to delay. It is hoped, however, to complete the entire subject in the near future.

The action of the recent Congress in providing for the year 1903 nearly the amount of money asked for by this office is most encouraging. For the first time in four years an urgent deficiency appropriation will not be needed to carry on the work and prevent the paralysis to all building operations, which would result from the closing down of the office early in the spring.

Appropriation having been made therefor, a considerable addition will be at once made to the metal map cases, etc., now in the record vault, whereby space enough will be secured to tide over the several years of construction of the new municipal building.

Many old maps of great value, relating to the earliest surveys of the city, will be photolithographed during the coming autumn, and thus preserved from destruction as to their essential data. It is intended to furnish the Library of Congress and the office of public buildings and grounds with copies of these lithographs. An interchange between the latter office and this office of photolithographic copies of all important old maps and other records held by each as custodian would largely solve the problem presented by the absence from each collection of the data in the others. The appropriation of \$300, secured from the last Congress for this purpose, is an earnest of the position of this office, which is believed to be heartily reciprocated by the officer in charge of public buildings and grounds.

The appropriation of \$2,000 for the resurvey of the Beatty & Hawkins Addition to Georgetown, now available, will be expended in obtaining, first, a very accurate map of all existing holdings and physical conditions in the tract, and second, in endeavoring to secure the largest possible concurrence in existing conditions of boundaries by the owners involved, confirmed by the exchange of quitclaim deeds, so as to make the new map the sole basis of reference hereafter. It is believed that this annoying question, which has made all sorts of trouble since 1769, will thus be relegated to the rear. At present there is nowhere a correct topographical map of the tract, or any part of it, and as to record, the less said about it the better. When an owner subdivides, plats, and conveys to others 165 feet more frontage in three separate tiers of lots than really exists on the ground, it is not surprising that some confusion should result.

Two projects still remain wherein special surveys are necessary to secure good results. The first of these is a complete clearing out of the entire boundary line of the District, much of which has been overgrown with heavy timber and obscured in various ways for a century. An appropriation of \$1,500 is needed for this, which should include the placing of monuments on each side of all roads intersected by the District line and also at all salient points of hill and valley, to enable this important line to be easily picked up at any time and followed from point to point. This matter is important in the capture of fugitive criminals, etc. The other project is the restoration of the original monuments at the corners of the blocks in the extreme eastern section of the city, these points having been largely destroyed during the civil war. This would cost about \$1,000. One or both of these matters should be provided for at the coming session of Congress.

I renew my urgent appeal for action determining the true status of the Eastern Branch water front. I do not know to what extent the matter of property rights in this locality will be taken up in connection with the survey authorized by the last Congress to be made by the War Department, but presume that this survey will relate chiefly to the question of the deepening of the channel and the reclamation of shoals adjacent thereto.

The following table shows in detail the work of the office:

*For private parties.*

Individual lots surveyed .....	1,240
Certificates of survey:	
Issued .....	830
Recorded .....	830
Surveys made to verify walls .....	282
Large tracts surveyed and subdivided .....	9
Subdivision blanks:	
Prepared .....	413
Duplicated for assessor .....	413
Subdivisions recorded in books .....	413
Plats to accompany applications for building permits .....	749

Plats made preliminary to surveys, new and old .....	1,249
Miscellaneous plats, large and small .....	80
Estimates issued in triplicate .....	1,349
Total of plats for private parties .....	5,004
Total of fees charged and paid to collector of taxes .....	\$8,652.40

*For the District of Columbia.*

Surveys made and certified .....	44
Copies of above certificates retained .....	44
Plats recorded .....	39
Indorsements made on communications .....	681
Reports on various subjects .....	125
Plats with reports .....	50
Retained copies of above plats .....	50
Points of survey referenced .....	32
Total of plats for District of Columbia .....	227

*Miscellaneous.*

Letters written to engineer department and private parties .....	397
Entries of all sorts on order book .....	1,649
Telephone calls, average per day, 17 .....	5,100
About one-third of time of clerks in record room taken up in answering questions and giving information to the public.	
Total of surveys, public and private .....	1,156
Total of plats, public and private .....	5,231

The above table shows increases over last year as follows: Fifty per cent as to individual lots for private parties, besides 282 surveys to verify walls; 26 per cent as to subdivisions recorded; 24 per cent as to plats.

Increases are noted in almost every division of the work of the office, and an average of the three percentages above noted (covering the bulk of the work), or 33 per cent, is practically the same as the general average found by the same method at the close of the last fiscal year (ending June, 1901).

This ratio of increase of each year's work over the preceding has obtained now for three or four years and is indicative of the growth of the District and the increasing use made of the office facilities by the public. It also shows that the office force must be maintained, commensurate in numbers and efficiency with the growing work.

It has been found increasingly necessary to enrich the already complete and valuable card index of every important matter in the office by a separate index of building restriction lines.

In conclusion, I wish to express my sincere appreciation of the excellent and conscientious work done by each and every member of the personnel of the office, without which the total of work above indicated could never have been turned out.

Very respectfully,

HENRY B. LOOKER,  
*Surveyor, District of Columbia.*

Maj. JOHN BIDDLE,  
*Corps of Engineers, U. S. Army,*  
*Engineer Commissioner, District of Columbia.*  
(Through Captain Newcomer.)

REPORT OF THE SUPERINTENDENT OF PARKING.

WASHINGTON, D. C., August 19, 1902.

SIR: In compliance with the instructions of the honorable Commissioners, District of Columbia, I have the honor to submit the following report of the work performed under the supervision of this office during the fiscal year ended June 30, 1902:

Two thousand six hundred trees were planted out on the streets of the city and suburbs, consisting of elms, ginkoes, lindens, Norway, silver and sugar maples, and pin and willow-leaf oaks, at an average expenditure of \$3 per tree on the street, boxed, staked, and strapped. This includes the labor of making the boxes,

digging the holes, filling them with good soil and carting away the rejected earth, removing the trees from the nursery, and the planting, boxing, staking, and strapping of the same, as well as the cost of the materials, namely, lumber, straps, strap iron, and nails.

Twenty-two thousand seedlings were planted out in the new nursery, these consisting of the varieties named as planted on the streets, and red and English oaks. They are all in good condition, and the seed beds are well stocked with varieties which experience has shown to be the best for this locality.

The care of the nurseries includes fencing a portion of the new nursery at the intersection of Richmond street and Brightwood avenue, the sowing of seed in beds, the planting of seedlings in nursery rows, and the pruning and general cultivation of trees in it. Also the general care of the old nursery at the foot of E street SE.

Tree trimming is one of the most important matters under the jurisdiction of this office, and, with the increase of area and number of trees planted annually, it becomes more so. If the standard of excellence now attained is to be maintained in the future, the amount of money to be used for this purpose must be increased very materially, else this or other deserving matters must be neglected. There are yet several thousand trees remaining in the parkings on streets too narrow for double rows, very many of which were planted previous to the regularly spaced trees at the curb line and have reached such a size that they should be severely trimmed in justice to the younger and more desirable varieties at the curb.

Six hundred and fifty casualties were reported by the police department, and about 223 by memorandums left at this office and at the District building. This work consisted in removing broken limbs from the streets, replacing leather straps which had become broken, and restaking loosened boxes.

Five hundred and eighty-three official communications were received, and inspections and reports made, which were necessary for the proper execution of the work. In the requests for trimming trees, it was very frequently necessary to see the parties to ascertain what was wanted, and sometimes several visits were made before this could be accomplished, thereby adding much to the work of this office.

Six hundred and forty-four trees were removed. Of these, 50 were in the way of street improvements, notably Gales street NE., Decatur street NW., and Twenty-second street NW. Many were removed because of objectionable location, injurious to other trees planted at the curb, and others because of their being too old and so badly decayed as to render their removal a matter of public safety. In accordance with your verbal instructions of May 17, 1902, an account showing the date, situation, age, surrounding pavements, size of tree space, and the cause of removal of all dead, dangerous, and otherwise objectionable trees has been kept, as shown in the accompanying paper.

During the first quarter of the fiscal year caterpillars appeared on the trees in large numbers, but the new appropriation for the year being available on their first appearance, they were vigorously attacked and subdued without any great defoliation of the trees. The "elm beetles," which usually attack the elms during the month of May, did not make their appearance, and as a result these trees present an unusually fine appearance at this time. It is noticeable that the elms are no more frequently attacked by the beetle than the other varieties are by the web caterpillars and other insects, but the former are much more difficult to exterminate because of the average size of the elm trees and the character of the insect. During the last month of the fourth quarter the web caterpillars again appeared on the trees, and this being at a time when the appropriation was nearly exhausted, much damage would have resulted had not the sum of \$1,000 been allotted from the emergency fund for their destruction, which enabled the parking commission to successfully contend with them.

In the removing and readjusting of tree wires some wires were removed because they had become so rusted as to be useless, many to admit of growth, and others because they had become so injured by horses being fastened to them as to be no longer of service. During the year all the wires in the northwest section, between North Capitol and Nineteenth streets, were gone over and put in as good condition as the material would permit. Numerous other places were given special attention also.

For several years after planting trees it is necessary to keep the tree spaces free from weeds, and, in fact, all growth, unless such spaces are sodded and properly cared for by private parties. The soil must be kept in such condition as to permit the trees to receive the full benefits of rainfall.

The work at the office yard consisted in the preparation of tree straps, making repairs to tree boxes, the grinding of axes and other edge tools, and miscellaneous items.

Considerable expenditure was made in improving the following by soiling and seeding, viz: Dent School parking, parking on New York avenue, between Eleventh and Thirteenth streets, NW.; the triangle at Twentieth and Baltimore streets, and the triangle at Nineteenth street and Columbia road.

*Expenditures for labor.*

Tree planting.....	\$7,800.00
Care of the nurseries.....	1,759.50
Trimming of trees on the streets.....	3,648.89
Repairing storm damages.....	1,000.00
Removing trees.....	1,200.00
Removing caterpillars.....	1,721.00
Paving around newly planted trees.....	254.00
Removing old decayed boxes.....	25.00
Mowing street parkings, etc.....	1,000.00
Readjusting wire tree guards.....	658.00
Cultivating trees on the streets.....	1,509.50
Work at the office yard.....	940.50
Gathering tree seeds (various kinds).....	25.00
Soiling and seeding parkings and triangles.....	389.00
Total amount expended for labor.....	21,928.89

*Expenditures for materials.*

Two horses.....	\$340.00
Lumber.....	2,300.00
Soil.....	270.00
Nails.....	95.00
Terra-cotta pipe.....	60.00
Strap iron.....	78.00
Grass seed and fertilizer.....	65.00
400 silver maples.....	80.00
Leather straps.....	300.00
Other materials.....	1,256.78

Total amount expended for materials.....	4,844.78
Total amount expended for labor.....	21,928.39

Total amount expended for materials and labor..... 26,773.15

Appropriation for year 1902.....	25,000.00
Allotment from emergency fund.....	1,000.00
Amount obtained through repayment vouchers.....	811.10

Total working amount.....	26,811.10
Total expended.....	26,773.15

Total unexpended..... 37.95

Four foremen were employed continuously during the year at the rate of \$3 per diem, aggregating a total expenditure of \$3,588.75.

Number of trees on the streets, as per last report.....	82,531
Number of trees removed during the year.....	644

Number of trees planted during the year.....	81,887
Number of trees now on the streets.....	2,600

Number of trees now on the streets..... 84,487

I recommend an increase of \$200 each in the salaries of the superintendent and assistant superintendent of parking.

Very respectfully,

TRUEMAN LANHAM,  
*Superintendent of Parking, District of Columbia.*

Maj. JOHN BIDDLE,  
*Corps of Engineers, U. S. Army,*  
*Engineer Commissioner, District of Columbia.*  
(Through Captain Newcomer.)

## Trees removed.

[NOTE.—C, P, S, designates "Continuous parking strip."]

Date.	Situation.		Age.	Kind of tree.	Pavement.		Size of space.	Cause of removal.
	Street.	Between—			Roadway.	Sidewalk.		
1902. May 20	Lydecker avenue	Holmead avenue and Fourteenth street.	1	Sycamore.	Gravel	Cement	C. P. S.	Dead; girdled by box tops.
20	do	do	1	do	do	do	do	Do.
20	P street NW	Sixth and Seventh streets.	15	Car. poplar	Asphalt	do	6 by 4 feet.	Dead; roots cut for new sidewalk.
20	Second street NW	G and Massachusetts avenue.	2	A. linden	do	do	do	Dead; girdled by box tops.
20	G street NW	First and New Jersey avenue.	2	Sycamore.	do	Brick	do	Dead; cause unknown.
20	D street NW	do	2	Soft maple	do	do	do	Dead; eaten by horses.
20	First street NW	C and D streets.	15	Norway maple	Granite block	Asphalt block.	do	Dead; killed by horses.
20	New Jersey avenue NW	do	2	Elm.	Asphalt	Brick	do	Dead; killed by escaping gas.
20	B street NW	First and Second streets.	9	do	Granite block	do	do	Dead; killed by gas.
21	Seventh street SW	B and C streets.	3	Aspen poplar	do	do	do	Dead; cause unknown.
21	New York avenue NW	Seventeenth and Eighteenth streets.	2	Sugar maple	do	do	do	Do.
21	M street NW	Twelfth and Thirteenth streets.	12	Soft maple	Asphalt	In parking.	6 by 4 feet.	Dead; roots cut for new sidewalk.
21	H street NW	Tenth and Eleventh streets.	1	do	do	Cement	do	Dead; killed by escaping gas.
21	M street NW	Eleventh and Twelfth streets.	1	do	do	Cement	do	Dead; killed by horses.
21	do	Ninth and Tenth streets.	1	do	do	do	do	Dead; cause unknown.
21	do	Eighth and Ninth streets.	1	do	do	Brick	do	Do.
21	N street NW	Sixth and Seventh streets.	12	Negundo	do	do	do	Dead; probably killed by pruning account caterpillars.
21	do	do	12	do	do	do	do	Do.
21	do	Fourth and Fifth streets.	12	do	do	do	do	Do.
21	do	do	12	do	do	do	do	Do.
21	do	do	12	do	do	do	do	Dead; bark had been severely injured.
21	G street SE	Sixth and Seventh streets.	12	Car. poplar	Granite block	do	7 by 3 feet.	Blown over—eaten by horses.
22	N street NW	Fourth and Fifth streets.	12	Negundo	Asphalt	do	do	Dead; repeated severe trimming, account caterpillars.
22	First street NW	M and New York avenue (3 trees).	1	Norway maple	do	Cement	C. P. S.	Dead; killed by escaping gas.
22	O street NW	Second and Third streets.	1	Soft maple	do	Brick	do	Dead; had been diseased for some time.
22	Warner street NW	New Jersey avenue and Fifth street.	12	Red maple	Macadam	do	7 by 3 feet.	Dead; cause unknown—not suited for street.



## Trees removed—Continued.

Date.	Street.	Situation.		Age.	Kind of tree.	Pavement.		Size of space.	Cause of removal.
		Between—				Roadway.	Sidewalk.		
142. May 20	Columbia road.....	Eighteenth and Nineteenth streets		4	Sugar maple.....	Asphalt.....	Cement.....	6 by 4 feet.	Dead; cause unknown.
20	Thirteenth street NW	Yale and Princeton.		2	Norway maple.....	Gravel.....	do.....	do.....	Dead; oil in straps.
23	Fourth street NW	New York avenue and M street.		17	Negundo.....	Granite block.....	Brick.....	6 by 2 feet.	Dead; probably pruning account caterpillars.
19	Second street NW	D and E streets.		11	E. linden.....	Asphalt.....	do.....	2 by 2 feet.	Decayed and dangerous.
19	B street SE.	First and Second streets (2 trees).		12	Negundo.....	do.....	Cement.....	6 by 3 feet.	Dead; killed by escaping gas.
20	Minnesota avenue SE.	Pennsylvania avenue and Anacostia road (12 trees).		15	Sycamore.....	Macadam.....	do.....	do.....	Dead; cause unknown.
20	Second street SE.	Corner of Virginia avenue		17	Aspen poplar.....	Dirt.....	Brick.....	6 by 3 feet.	Leaning over the street.
20	R street NW	Thirteenth and Fourteenth streets.		12	A. linden.....	Asphalt.....	do.....	do.....	Dead; killed by gas.
June 4	I street NW	Eighteenth and Nineteenth streets.		20	Car. poplar.....	Dirt.....	do.....	6 by 2 feet.	Dead; eaten by horses.
5	Fourteenth street NW	I and K streets.		30	Soft maple.....	Asphalt.....	Cement.....	do.....	Dead; roots cut in curb setting.
5	Thirteenth street NW	New York avenue and I street.		13	Aspen poplar.....	do.....	Brick.....	do.....	Dead; cause unknown.
May 19	Second street NW	E and F streets.		15	A. linden.....	do.....	do.....	6 by 3 feet.	Dead; killed by horses.
21	Pennsylvania avenue SE.	Minnesota avenue and Bridge street (5 trees).		17	Sycamore.....	Gravel.....	do.....	do.....	Dead; eaten by horses.
21	I street NW	Seventh and Eighth streets.		17	Car. poplar.....	Asphalt.....	Cement.....	6 by 3 feet.	Dangerous from winds and root mutilation.
22	Virginia avenue SE.	do.....		14	A. linden.....	do.....	In parking.	do.....	Objectious; in way of new steps.
22	Nineteenth street NW	R and S streets.		24	Aspen poplar.....	do.....	In parking.	do.....	Obscured light from house.
22	Fifth street SE.	E and G streets (7 trees).		20	A. linden.....	Granite block.....	Brick.....	6 by 4 feet.	Dead; caused by escaping gas.
June 2	Fourteenth street NW	E and F streets (3 trees).		19	Soft maple.....	do.....	do.....	do.....	In way of new building (Mr. Willard's).
2	Twenty-second street NW	L and M streets.		27	do.....	Asphalt.....	do.....	6 by 3 feet.	Dead; killed by gas.
2	M street NW	Tenth and Eleventh streets		22	do.....	do.....	In parking.	do.....	In line of a new fence.
8	A street NE.	Sixth and Seventh streets.		26	do.....	do.....	Cement.....	6 by 3 feet.	Dangerous; broken during storm.
8	Twenty-first street NW	H and I streets.		20	do.....	do.....	In parking.	do.....	Dead; killed by gas.
8	D street SW	First and Second streets.		10	do.....	do.....	Brick.....	6 by 3 feet.	Dead; stridled by horses.
8	Jefferson street east of Polk street.	Third and Fourth streets.		24	Aspen poplar.....	Gravel.....	do.....	C. P. S.	In way of new sewer trap.
4	C street SW	Twentieth and Twenty-first streets.		10	Soft maple.....	Asphalt.....	do.....	6 by 3 feet.	Dead; killed by horses.
5	K street NW	do.....		15	do.....	do.....	do.....	6 by 2 feet.	Blown down during storm.
6	Twenty-first street NW	K and L streets.		17	do.....	do.....	do.....	do.....	Dead; killed by gas.

Total number trees removed since May 17, 1902, 190.

## SUBSURFACE AND BUILDING DIVISIONS.

Capt. CHESTER HARDING,

*Corps of Engineers, United States Army, Assistant to the Engineer Commissioner in charge.*

WATER DISTRIBUTION.....	W. A. MCFARLAND, <i>Superintendent Water Department.</i>
WATER RATES.....	GEORGE F. GREEN, <i>Water Registrar and Chief Clerk, Water Department.</i>
SEWER CONSTRUCTION AND MAINTENANCE .....	D. E. MCCOMB, <i>Superintendent of Sewers.</i>
PLUMBING PLANS AND INSPECTION .....	O. L. INGALLS, <i>Inspector of Plumbing.</i>
BUILDING AND BUILDING INSPECTION.....	{ SNOWDEN ASHFORD, <i>Inspector of Buildings.</i>
	{ A. M. LAWSON, <i>Inspector of Elevators.</i>
REPAIRS TO BUILDINGS .....	G. B. COLEMAN, <i>Superintendent of Repairs.</i>

## REPORT OF ASSISTANT IN CHARGE.

OFFICE OF THE ENGINEER COMMISSIONER,  
DISTRICT OF COLUMBIA,  
*Washington, October 13, 1902.*

MAJOR: I have the honor to forward herewith the reports of the divisions of the engineer department under my charge for the year ending June 30, 1902, as submitted by the superintendent of the water department, the water registrar, the superintendent of sewers, the inspector of plumbing, the inspector of buildings, and the superintendent of repairs.

Very respectfully, your obedient servant,

CHESTER HARDING,

*Captain, Corps of Engineers, Assistant to Engineer Commissioner.*

Maj. JOHN BIDDLE,

*Corps of Engineers, Engineer Commissioner.*

## REPORT OF THE SUPERINTENDENT OF THE WATER DEPARTMENT.

WASHINGTON, D. C., *July 21, 1902.*

SIR: I have the honor to submit the following report of work done by the distribution branch of the water department for the fiscal year ending June 30, 1902.

The routine work of main extension, fire-hydrant erection, etc., is fully set forth in the accompanying tables, to which reference is made for details of cost, etc. The total length of mains laid during the year was 54,209 feet, equal to about 10 miles, as against 65,812 feet for the year preceding.

Eighty-three fire hydrants were set, bringing the total number available for use up to 2,114.

### PUMPING STATIONS.

*U street.*—No changes of any importance were made in the equipment during the year.

On July 19 the 8,000,000-gallon pump was disabled by the parting of a number of steel studs connecting the upper and lower sections of the intermediate water chamber; repairs were at once begun. On the morning of July 20, the auxiliary engine of the 7,000,000-gallon pump was wrecked by the breaking of the beam at the trunnions. This left an area with a population of about 50,000 people and a normal water consumption of 8,000,000 gallons a day dependent on a reserve supply of 24,000,000 gallons in Brightwood reservoir and the pumpage of two small pumps with a combined capacity of 1,500,000 gallons a day.

As many extra machinists and helpers as could be used on the work were at once employed, and by 1 o'clock a. m. on the 21st sufficient repairs had been made on the 7,000,000-gallon auxiliary to enable the starting of this pump. Some three days later the 8,000,000-gallon pump was started.

The work of repair was made particularly difficult by reason of the small amount of space available and the extreme heat.

# 100 OPERATIONS OF THE ENGINEER DEPARTMENT, D. C.

Following are items of chief interest from station records:

Water pumped during year:			
Middle service .....	million gallons ..	2,065	
High service .....	do .....	117	
Total .....	do .....	2,782	
Per cent increase over year ending June 30, 1901:			
Middle service .....		41.25	
High service .....		21.88	
Water pumped per day during year:			
Middle service .....	gallons ..	7,301,179	
High service .....	do .....	320,532	
Total .....	do .....	7,621,711	
Coal burned during year .....	pounds ..	5,485,715	
Coal burned per day, mean .....	do .....	15,029	
Cost of coal per year .....		\$7,956	
Cost of coal per day, mean .....		\$21.79	

## Cost of pumping during year.

Running expenses at station:			
Labor .....		\$12,929.44	
Coal .....		7,956.00	
Oil .....		517.81	
Waste .....		271.00	
Miscellaneous supplies .....		596.40	
Material for repairs .....		1,064.96	
Total .....		23,235.61	
Per day, mean .....		\$63.63	
Cost of land .....		2,275.00	
Cost of building .....		30,000.00	
Cost of machinery .....		75,000.00	
		107,275.00	
Interest, at 3 per cent .....		3,218.25	
Depreciation, building and machinery .....		3,150.00	
Grand total .....		29,604.86	
Per day .....		81.11	
Total cost of pumping 1,000 gallons under actual conditions (including interest and depreciation) .....	cents ..	1.06	

Anacostia station.—This station has been in continuous use during the year, delivering water, by direct pressure, to a height of about 190 feet above tide, and giving excellent service. The pump used is an old direct-acting "Blake," of low efficiency. It is hoped that in the near future the water department may be enabled to replace this pump with a modern one of high-duty type, and build a permanent station building in place of the present temporary wooden structure.

Following are the principal data of interest from this station's records:

Water pumped during year .....	million gallons ..	141	
Mean, per day .....	gallons ..	386,300	
Coal burned during year .....	pounds ..	998,515	
Coal burned per day, mean .....	do .....	2,735	
Cost of coal per year .....		\$1,448.74	
Cost of coal per day, mean .....		3.96	

\*This small increase is due to the fact that area supplied by pumps was reduced by extension of gravity service, made possible by completion of Washington Aqueduct extension.

*Cost of pumping.*

Labor .....	\$4,948.07
Oil .....	69.52
Coal .....	1,448.74
Waste .....	10.29
Miscellaneous items .....	192.86
Material for repairs .....	16.75
<b>Total .....</b>	<b>6,686.23</b>
Per day, mean .....	\$18.32
 Cost of land .....	 900.00
Cost of building .....	5,039.72
Value of machinery .....	1,000.00
 <b>6,939.72</b>	
Interest, at 3 per cent .....	208.19
Depreciation, building and machinery .....	181.18
 <b>Grand total .....</b>	 <b>7,075.60</b>
Per day .....	19.38
Total cost pumping 1,000 gallons under actual conditions. .... cents..	5.018

*Reservoirs.*—Reno and Brightwood reservoirs have been in continuous service during the year; adjoining Reno reservoir the water department has acquired a parcel of land 100 feet square on which to build a water tower for the better supply of land lying above the 350-foot contour. It is hoped to commence this work during the current year. At Brightwood reservoir two gatehouses of granite have been completed, iron railing around basins built, and roadways kept in good condition. This work is now practically complete.

*Trumbull Street pumping station.*—The erection of this building under contract with the George A. Fuller Company is well under way, though a delay of some three months has been caused by difficulty in securing material; at the present time, June 30, the walls are up to the level of first-floor beams. Contracts have been made with Westinghouse, Church, Kerr & Co. for steam-generating equipment; with Pawling & Harnischfeger for 20-ton electric crane; with Michigan Brass and Iron Works for large water gates; with the United States Cast Iron Pipe and Foundry Company for flanged water-pipe specials; with the Allis-Chalmers Company for new water end for 8,000,000 gallon pumping engine; with Henri Kampmann for coal pockets of 1,000 tons storage capacity; and with Johnson & Morton for switchboards.

During the ensuing year contracts will be made for coal and ash conveying machinery, elevators for storage rooms, steam-heating equipment, etc.

Electrical generating machinery was bought in open market, one 150-kilowatt and one 50-kilowatt machine being purchased.

*Office records.*—The work of preparing a card index record of water gates showing exact location and giving all available data is progressing in a satisfactory manner. Up to the end of the year about 1,859 gates have been so recorded and indexed. In the older parts of the city this has proved a work of much difficulty. Other records and maps have been kept well up to date and are in excellent shape.

The chief works contemplated for the coming year in addition to routine extensions are the practical completion of building for Trumbull Street pumping station; the laying of 48-inch and 36-inch mains from that station to Capitol Hill and to Thirteenth street and Florida avenue; the alteration of service mains on Capitol Hill, to prevent the occurrence of "dead ends" on the boundary line between "Low" and "First" high-service areas; the building of a tower or elevated tank, as stated above, near Reno reservoir; and, possibly, preparation of plans for a high-service reservoir for the territory east of the Anacostia River.

There is also under consideration a change in size of outlet openings of all fire hydrants from 2½ to 4 inches diameter; this change is much desired by the fire department, and it would no doubt be of considerable value. Satisfactory plans for this change have not yet been completed.

On October 3, 1901, there was submitted a project for the installation of a high-

pressure-fire service system for the business section of the city. A copy of this report is appended hereto.

In conclusion I wish to record my appreciation of the active interest shown by the employees of this department in the execution of their work, and of the excellent results attained.

Very respectfully,

W. A. MCFARLAND,  
*Superintendent Water Department.*

Maj. JOHN BIDDLE,  
*Corps of Engineers U. S. Army,  
Engineer Commissioner, District of Columbia.  
(Through Captain Harding.)*

WASHINGTON, October 3, 1901.

CAPTAIN: I have the honor to submit for your consideration the following project for the installation of a separate high-pressure fire-service system for the city of Washington.

The project, in brief, is to utilize the water pressure from the Reno reservoir, having a mean elevation of 415 feet above tide level, by means of large trunk mains extending to the principal business sections of the city, and by special high-pressure hydrants properly spaced over such territory as it might be desired to cover. The system is to be used for fire protection only.

The general arrangement of mains proposed is shown on the accompanying map.<sup>a</sup> The only territory there covered is the principal business section of the northwest bounded by Sixth, I, Seventeenth streets, and Pennsylvania avenue. The system as planned, however, is capable of subsequent extension to any desired extent over territory inside of the city limits. Such extension would require only a further laying of trunk and branch mains.

If a 36-inch trunk main be laid as indicated on the map herewith, an effective head of water of about 357 feet will be obtained at hydrants on F street, for example, while 10,000 gallons of water per minute are flowing through the mains; this amount of water is equivalent to 30 strong fire streams through 1½-inch nozzles. The pressure on Pennsylvania avenue would be some 30 feet greater.

As examples of what can be accomplished by these pressures reference is made to the elaborate experiments of John R. Freeman, as reported to the American Society of Civil Engineers in 1889.

For instance, if two lines of 2½-inch hose, each 400 feet long, were siamesed into one line near the play pipe and a 1½-inch smooth nozzle used at street level, a head of 357 feet at the hydrant would project a stream of 456 gallons per minute to an extreme height of 150 feet, or a good effective fire stream to a height of 100 feet.

If a single line of 2½-inch hose 600 feet long were carried to the top of a 200-foot building, the pressure would be sufficient to deliver at that height a volume of 180 gallons per minute through a 1½-inch smooth nozzle and throw it to a farther height of 40 feet; or, if needed, thirty such lines would deliver each an equal amount.

Even if 1,000 feet of hose were used, there would be delivered a volume of 330 gallons per minute through a 1½-inch smooth nozzle.

With an increase from 30 streams to 40 the effective head would be reduced, on F street, to about 338 feet, still sufficient for an excellent service.

The estimated cost of this entire work, covering main trunk line as shown, secondary trunk lines 24 inches in diameter, service mains 16 inches in diameter, and 200 special 3-nozzle high-pressure fire hydrants, is \$496,235.

One effect of putting such a service as this in successful operation would almost certainly be a reduction in insurance rates, as there can be no question that it would largely reduce the fire risk.

In this connection attention is invited to the experience of Providence, R. I., where, in October, 1897, a high-pressure fire-service system was put in operation over a part of the city—about one-half square mile.

Previous to the installation of this high-pressure service there were water pressures of from 40 to 75 pounds per square inch (much better than those now available in that part of the city of Washington under discussion). The static heads

<sup>a</sup> Not printed.

at the hydrants in the Providence system varied from 196 to 267 feet, while those in the system as proposed for Washington would range from 355 to 385 feet.

In writing of the Providence system, E. B. Weston, civil engineer, says (Journal of N. E. Waterworks Association), September, 1898:

"The high-pressure fire service seems to give general satisfaction to all concerned.

"The insurance rates have been reduced 5 per cent within the district which it is intended to protect, and an authority in regard to insurance has estimated that the holders of policies within the district will save in ten years, owing to smaller premiums being paid, an amount which will exceed the total cost of the entire system. During a large fire last December (1897), in the opinion of the fire commissioners and others, the system practically paid for itself, as the fire was kept within the walls of the building in which it originated by the aid of the high-pressure fire service." \* \* \*

The cost of the Providence system was \$143,175.

An important point in favor of the separate high-pressure service is that it will encourage the extensive introduction of automatic sprinklers. There are at present but few of these in use in this city, and those few are served by local pumps and roof tanks. If the high-pressure service were introduced these sprinklers would be directly connected with the street mains, thus obtaining higher pressure and much more certain supply.

- As a partial offset to the cost of construction would be the saving to the fire department in the matter of apparatus. Steamers would be dispensed with in the high-pressure districts, thus saving first cost and maintenance charges, and incidentally leaving more men free for the actual work of fighting fire.

Ever if the high-pressure service be not constructed it will be necessary in a few years to lay a new main from the pumping station to Reno reservoir, at an estimated cost of \$120,000. This amount also should be considered as a partial offset to the first cost of the system.

The decreased fire risk and consequent reduction in insurance rates alone would, in my opinion, fully justify the expenditure necessary to secure these results.

In safety from accidental derangement the system would be much better than that now in use, as the trunk line would be served from the reserve supply (4,500,000 gallons) in Reno reservoir, with an elevation of 415 feet at one end and directly from the pumping engines at the other. There would be made an emergency connection with the Brightwood reservoir (30,000,000), with an elevation of 278 feet above tide for use only in case both other sources of supply should fail.

Should the Commissioners approve of this project it is recommended that Congress be asked to appropriate for the work, as all available funds of the water department are needed for the completion of the new domestic distribution system now under construction.

Should such appropriation be made it would be well to enact that the system below elevation of 200 feet should be used for no purpose but the supply of street fire hydrants and sealed automatic sprinkler systems, and that high-pressure fire hydrants should be used by no persons other than employees of the fire and water departments.

Following are given in outline the calculations on which the foregoing statements are based.

1. *Determination of size of trunk main.*—Length of main from reservoir to center of District, 27,000 feet; length of main from pumps to center of District, 12,000 feet; capacity of pumping engine available for this service, 4,100 gallons per minute; maximum rate of flow, based on 30 simultaneous streams of 333 gallons per minute each, 10,000 gallons per minute; with pumps running, rate of flow from reservoir to center of District, for 30 streams,  $10,000 - 4,100 = 5,900$  gallons per minute, through 27,000 linear feet of main.

(a) Assuming a 30-inch main, with average deterioration at end of ten years, we have from Weston's tables, friction loss per 1,000 feet of pipe for 5,900 gallons flow, 1.22, or a total loss of head of 27 by  $1.22 = 33$  feet. With pumps stopped, rate of flow would be 10,000 gallons per minute, which, from same tables, would result in a total loss of head of 93 feet.

(b) Assuming a 36-inch main, the total losses of head under similar circumstances would be, respectively, 13 and 37 feet. The former losses are, in my opinion greater than should be permitted, and I have therefore recommended the larger main, 36 inches in diameter.

2. *Estimates of cost.*

## (a) 30-inch trunk main, 39,000 feet long:

Pipe:	Pounds.
10,000 linear feet, at 290 pounds per foot .....	2,900.00
2,000 linear feet, at 336 pounds per foot .....	672.00
3,000 linear feet, at 400 pounds per foot .....	1,200.00
24,000 linear feet, at 452 pounds per foot .....	10,848.00
	<hr/> 15,620.00
15,620,000 pounds cast-iron pipe, at 1 cent .....	\$156,200.00
300,000 pounds lead, at 5 cents .....	15,000.00
Labor and miscellaneous material, at \$1.75 per foot .....	68,250.00
Total estimated cost 30-inch trunk main .....	<hr/> 239,450.00

## (b) 36-inch trunk main, 39,000 feet long:

Pipe:	Pounds.
10,000 linear feet, at 392 pounds per foot .....	3,920.00
2,000 linear feet, at 455 pounds per foot .....	910.00
3,000 linear feet, at 545 pounds per foot .....	1,635.00
24,000 linear feet, at 624 pounds per foot .....	14,976.00
	<hr/> 21,441.00
21,441,000 pounds cast-iron pipe, at 1 cent .....	\$214,410.00
330,000 pounds lead, at 5 cents .....	16,500.00
Labor and miscellaneous material, at \$2 per foot .....	78,000.00
Total estimated cost of 36-inch trunk main .....	<hr/> 308,910.00

Excess of cost of 36-inch over 30-inch main, \$308,910—\$239,450 ..... \$69,460.00

## (c) Estimated length of 24-inch secondary trunk mains for No. 1 district, 15,000 feet.

	Pounds.
15,000 feet cast-iron pipe, at 307 pounds per foot .....	4,605.00
4,605,000 pounds pipe, at 1 cent .....	\$46,050.00
50,000 pounds lead, at 5 cents .....	2,500.00
Labor, etc., at \$1.10 per foot .....	16,500.00
Total .....	<hr/> 65,050.00

## (d) Estimated length of 16-inch service mains for No. 1 district, 30,000 feet:

30,000 feet cast-iron pipe, at 158 pounds per foot .....	pounds.. 4,740.00
4,740,000 pounds pipe, at 1 cent .....	\$47,400.00
62,500 pounds lead, at 5 cents .....	3,125.00
Labor, etc., at 75 cents per foot .....	22,500.00
	<hr/> 73,025.00

## (e) Estimated length 10-inch branch pipes, 10,000 feet:

10,000 feet cast-iron pipe, at 77 pounds per foot .....	770.00
770,000 pounds pipe, at 1 cent .....	\$7,700.00
9,000 pounds lead, at 5 cents .....	450.00
Labor, etc., at 50 cents per foot .....	5,000.00
	<hr/> 13,150.00

## (f) 200 special hydrants, at \$100 .....

20,000.00

OPERATIONS OF THE ENGINEER DEPARTMENT, D. C. 105

(g) Special gates:	
14 36-inch, at \$500 .....	\$7,000.00
10 24-inch, at \$150 .....	1,500.00
40 16-inch, at \$65 .....	2,600.00
200 10-inch, at \$25 .....	5,000.00

16,100.00

SUMMARY.

(b) .....	\$308,910.00
(c) .....	65,050.00
(d) .....	73,025.00
(e) .....	13,150.00
(f) .....	20,000.00
(g) .....	16,100.00

Total ..... 496,235.00

Very respectfully,

W. A. McFARLAND,  
Superintendent Water Department.

Capt. CHESTER HARDING,  
United States Corps of Engineers,  
Assistant to Engineer Commissioner, District of Columbia.

TABLE I.—Mains laid and miscellaneous work during the fiscal year ending June 30, 1902.

New mains laid:		
30 inches diameter .....	linear feet ..	1,227
20 inches diameter .....	do ..	203
12 inches diameter .....	do ..	14,010
6 inches diameter .....	do ..	35,481
4 inches diameter .....	do ..	1,414
3 inches diameter .....	do ..	1,632
2½ inches diameter .....	do ..	242
Mains lowered .....	do ..	4,204
New stop valves .....		138
Fire hydrants erected .....		88
Public hydrants erected .....		7
Horse fountains erected .....		10

TABLE II.—Summary of the distribution system.

	In service prior to June 30, 1901.	Added during fiscal year.	Total June 30, 1902.
75 inches diameter .....	600		600
48 inches diameter .....	30,000		30,000
36 inches diameter .....	34,082		34,082
30 inches diameter .....	37,720	1,227	38,947
24 inches diameter .....	21,545		21,545
20 inches diameter .....	36,366	203	36,569
16 inches diameter .....	2,508		2,508
12 inches diameter .....	202,543	14,010	214,987
10 inches diameter .....	10,255		10,255
Total trunk mains .....	375,619	15,440	389,483
8 inches diameter .....	6,005		6,005
6 inches diameter .....	1,433,583	35,481	1,469,064
4 inches diameter .....	131,882	1,414	133,296
3 inches diameter .....	61,435	1,632	63,067
2½ inches diameter .....		242	242
2 inches diameter .....	4,118		4,118
1½ inches diameter .....	3,802		3,802
Grand total .....	2,016,444	54,209	2,069,087
Stop valves .....	4,228	138	4,366
Fire hydrants .....	2,081	88	
Public hydrants .....	833	7	
Service connections .....	46,569	1,401	
Horse fountains .....	86	10	

<sup>a</sup> 1,566 feet of 12-inch main abandoned.

<sup>b</sup> 11 public hydrants abandoned.

TABLE III.—Statement showing cost of water mains laid during the fiscal year ending June 30, 1902—Continued.

Location.	Size.	Length.	Cost of labor.	Cost of material.	Total cost.
Center of Randolph street NW., east from Connecticut avenue	Ins. 6	Lin. ft. 670.7	\$200.24	\$230.00	\$430.24
Center of Ingraham street NW., between Thirtieth street and Brightwood avenue	6	500.0	99.00	218.43	317.43
West side of First street NW., between Albany and Baltimore streets	6	381.9	72.75	144.98	217.73
Center of Twelfth street NE., south from Detroit street	6	147.0	28.56	73.04	101.60
Center of Eighth street NW., between Des Moines and Erie streets	6	390.5	63.00	155.51	218.51
South side of Virginia avenue NW., west from Twenty-fourth street	8	344.3	113.97	259.49	373.46
Center of V street NE., east from Third street and center of Third north from V street	6	434.0	85.87	238.17	324.04
West side of New Jersey avenue NW., between Q and Franklin streets	6	210.2	64.94	85.21	150.15
Center of Howard avenue NW., east from Nineteenth street	6	175.5	39.00	71.29	119.29
East side of First street NW., between Albany and Baltimore streets	6	459.1	120.50	281.49	401.99
Center of Princeton street NW., between Sherman avenue and Eleventh street	6	49.0	17.00	19.88	36.88
Center of Columbia avenue NW., between Sherman avenue and Thirtieth street	6	71.7			
	12	1,047.9	358.55	1,063.19	1,421.74
East side of Connecticut avenue extended, from Pierce Mill Road to Cathedral avenue NW	12	6,017.5	2,597.93	5,099.88	7,697.81
West side of Bladensburg Road, from Mount Olivet Road to Standard Buttrine plant	12	5,378.5	2,009.83	5,920.74	8,039.57
Across Pennsylvania Avenue Bridge SE.	12	1,506.5	442.38	1,690.64	2,133.02
West side of Seventeenth street, from U to V streets; north side of V street, from Seventeenth street to Champlain avenue; west side of Champlain avenue, from V street to Washington Aqueduct shaft	20 30	203.6 1,227.0	2,409.71	5,925.94	8,335.65
Total cost for laying mains and connections, including repairs to pavements			18,260.18	38,975.29	57,235.47
Uncompleted main June 30, 1901				440.85	440.85
Uncompleted fire hydrants June 30, 1901				14.91	14.91
Cost of erecting fire hydrants, including repairs to pavements			944.68	5,102.14	6,046.82
Cost of superintendence			1,676.50		1,676.50
Grand total			20,881.36	44,533.20	65,414.56

TABLE IV.—Statement of length and cost of water mains laid from July 1, 1878, to June 30, 1902.

Fiscal year.	36-inch.	30-inch.	24-inch.	20-inch.	16-inch.	12-inch.	10-inch.	8-inch.
	Lin. ft.	Lin. ft.	Lin. ft.	Lin. ft.	Lin. ft.	Lin. ft.	Lin. ft.	Lin. ft.
1878	40					3,719		
1879						7,409		
1880								
1881								
1882								
1883						1,625		
1884						1,038		
1885						763		
1886						1,938	791	
1887				4,835		1,124	2,908	
1888						731		
1889			2,312	5,140		5,626	2,784	
1890								
1891						5,201		
1892				2,926	2,500	10,163		
1893						6,473		
1894				278		39,386		
1895		6,617		8,874		27,731		
1896		294		2,180		11,873		
1897						6,877		
1898						7,698		
1899				1,914		2,220		
1900	10,902		35	1,282	48	157		
1901						10,023		
1902		1,227		203		14,010		
Total	10,942	1,227	9,258	27,632	2,548	165,988	6,573	

TABLE IV.—Statement of length and cost of water mains, etc.—Continued.

Fiscal year.	6-inch.	4-inch.	3-inch.	2½-inch.	2-inch.	1½-inch.	Total.	Cost.
	<i>Lin. ft.</i>	<i>Lin. ft.</i>	<i>Lin. ft.</i>	<i>Lin. ft.</i>	<i>Lin. ft.</i>	<i>Lin. ft.</i>	<i>Lin. ft.</i>	
1878	12,781	30					12,811	\$14,846.80
1879	8,516	1,397					9,913	19,436.03
1880	3,024						3,024	
1881	3,709						3,709	3,110.70
1882	1,920						1,920	1,626.43
1883	4,084						4,084	8,073.70
1884	8,972						8,972	10,492.51
1885	27,766	358	485				28,609	25,865.35
1886	35,192		6,023				41,215	40,025.10
1887	30,041	292	7,124				37,457	50,351.00
1888	9,123	9,148	3,937				22,208	17,626.63
1889	36,742	6,571	8,753				52,066	79,342.16
1890	34,737	2,856	2,855				40,448	19,113.54
1891	56,893	3,142	11,013				71,058	49,702.65
1892	88,709	3,342	1,286				93,337	74,733.04
1893	54,173	8,396	3,458				66,027	56,339.39
1894	86,632	12,832	2,918				102,382	126,599.55
1895	103,785	5,442	2,733				111,960	134,532.31
1896	61,464	1,738	3,262				66,464	89,395.12
1897	71,299	10,595	992			2,104	84,990	77,954.81
1898	52,371	6,735	2,790		1,633	500	63,299	48,661.70
1899	84,291	4,602	2,701		79	133	91,706	65,774.52
1900	53,838	4,211	2,116		17	453	60,635	114,784.72
1901	52,018	2,187	935			646	55,780	47,426.71
1902	35,481	1,414	1,632	242			38,770	57,676.33
Total	1,017,528	85,288	65,613	242	1,729	3,896	1,398,796	1,240,080.20

TABLE V.—Average cost per foot for laying mains of various sizes, excluding repairs to improved pavements, during the fiscal year ending June 30, 1902.

Size.	Linear feet.	Cost of material.	Cost of labor.	Total cost.
2½-inch	242	\$0.292	\$0.441	\$0.733
3-inch	550	.374	.501	.875
4-inch	1,390	.270	.453	.728
6-inch	34,061	.272	.498	.770
12-inch	14,010	.390	.980	1.370
20-inch	203			
30-inch	1,227	1.630	4.130	5.760

TABLE VI.—Statement of length and cost of water mains laid for the extension of the high-service system of water distribution from July 1, 1893, to June 30, 1902.

Size of main.	Laid to June 30, 1901.	Laid during year ending June 30, 1902.	Total.
1½-inch	2,717		2,717
2-inch	1,095		1,095
3-inch	1,808		1,808
4-inch	5,417	284	5,701
6-inch	162,804	25,673	188,477
12-inch	84,025	14,010	98,035
16-inch	48		48
20-inch	14,529	203	14,732
24-inch	6,946		6,946
30-inch		1,227	1,227
36-inch	10,902		10,902
Total	290,291	41,397	331,688

Total cost to June 30, 1901.....\$387,212.44

Total cost for fiscal year ending June 30, 1902.....47,679.75

Aggregate cost to June 30, 1902.....434,892.19

# 110 OPERATIONS OF THE ENGINEER DEPARTMENT, D. C.

TABLE VII.—Daily average consumption, middle and high services.

Month.	Middle.	High.	Month.	Middle.	High.
1901.			1902.		
July.....	8,441,045	343,877	January.....	8,615,046	370,080
August.....	8,227,887	285,256	February.....	8,780,661	375,882
September.....	8,518,641	291,945	March.....	7,852,748	310,779
October.....	8,406,060	333,484	April.....	7,920,406	281,594
November.....	8,153,604	319,576	May.....	7,766,720	310,084
December.....	8,561,323	328,060	June.....	8,096,575	345,041

TABLE VIII. Statement of the number of shallow and deep wells.

	Shallow wells.	Deep wells.	Total
In service June 30, 1901.....	62	40	102
Closed and discontinued during fiscal year ending June 30, 1902.....	0	0	0
In service June 30, 1902.....	62	40	102

Number of assistant engineers, clerks, inspectors, foremen, and other employees (exclusive of day laborers) in the employ of the Water Department of the District of Columbia, and the appropriation from which paid, for the fiscal year ending June 30, 1903.

Designations.	Number.	Per diem.	Appropriation from which paid.			Total.
			Pumping expenses and pipe distribution.	High-serv. ice system, water distribution.	Purchase and repair of pumps.	
Assistant engineer.....	1	\$3.00		\$300.00		\$300.00
Do.....	1	5.00		300.00		300.00
Superintendent of construction.....	1	6.00		672.00		672.00
Superintendent of stables.....	1	5.00	\$510.00			510.00
Inspector.....	1	5.00		1,005.00		1,005.00
Inspectors.....	5	4.50	544.50	2,085.88		2,630.38
Inspector.....	1	4.00		336.00		336.00
Do.....	1	3.00		862.25		862.25
Inspectors.....	13	2.50	87.50	5,368.00		5,455.50
Clerk.....	1	4.50	1,408.50			1,408.50
Clerks.....	6	4.00	1,064.00	2,156.50		3,220.50
Instrument man.....	1	3.50		1,085.50		1,085.50
Rodman.....	1	3.00		336.00		336.00
Do.....	1	2.50		500.00		500.00
Chainman.....	1	2.25		625.50		625.50
Draftsman.....	1	3.00		327.00		327.00
Do.....	1	2.50		542.50		542.50
Assistant foreman.....	1	3.50	1,102.28			1,102.28
Assistant foremen.....	2	3.00	534.00	429.00	\$365.00	1,328.00
Do.....	2	2.50	627.50	52.50	41.87	721.87
Chief steam engineer.....	1	4.50	1,167.48			1,167.48
Assistant steam engineer.....	1	4.00	228.00			228.00
Assistant steam engineers.....	5	2.50	2,325.00			2,325.00
Do.....	3	2.00	556.50			556.50
Machinist.....	1	4.00	126.00			126.00
Assistant machinist.....	1	3.50	1,017.63			1,017.63
Assistant machinists.....	2	3.00	317.25	564.00		881.25
Plumbers.....	2	3.50	2,067.36			2,067.36
Plumber.....	1	8.00	819.00			819.00
Storekeeper.....	1	3.00	950.25			950.25
Assistant storekeeper.....	1	2.50	713.75			713.75
Carpenter.....	1	3.00	906.25			906.25
Do.....	1	3.25	49.06			49.06
Blacksmith.....	1	3.25	165.75			165.75
Do.....	1	3.00	760.50			760.50
Assistant tapper.....	1	2.50	577.00	182.50		759.50
Firemen.....	4	2.50	2,625.00			2,625.00
Do.....	7	2.00	2,344.00			2,344.00
Watchman.....	1	2.50		912.50		912.50
Watchmen.....	4	1.75	1,898.49	638.75		2,537.24
Messengers.....	3	1.75	1,006.68			1,006.68
Total.....	86		26,567.23	20,513.88	906.87	47,987.98

REPORT OF THE WATER REGISTRAR.

WASHINGTON, D. C., August 11, 1902.

SIR: Complying with the order of July 3, 1902, I present herewith the annual report of the revenue and inspection branch of the water department for the fiscal year ending June 30, 1902. The report shows the financial condition, the work performed during the past year, together with such recommendations as are deemed necessary.

Inspections made, noted, and recorded.....	105,923
Cash receipts posted (average item \$6).....	\$395,000
Premises in which leaks were found.....	7,491
Water-rent bills delivered by inspectors.....	32,634
Water-rent bills made out.....	65,000
Water-main assessment notices delivered.....	911
Tax certificates examined.....	6,520
Taps issued.....	1,412
Stopcocks issued.....	1,273
Permits examined.....	2,558
Files received, recorded, and answered.....	900
Letters sent out.....	488
Permits for water for building purposes issued.....	642

The financial condition of the department, as will be seen by this statement, has not only equaled the past years, but surpassed them.

During the year just closed the task of reexamining and remeasuring all the houses in the District supplied with Potomac water was completed and the inspectors' returns entered upon the records.

The year also witnessed the inauguration of a card index system for complaints, and another for meters.

In 1900 this office was relieved of the duty of inspecting yard hydrants, the work incidental thereto devolving upon the inspector of plumbing. Last year these examinations were reassigned to this office.

During the past year 253 new water meters were installed, and the good work continues. Large consumers and business men in general realize the advantage of paying for exactly what is furnished, and as a rule cheerfully comply with directions from the office to set meters.

The new schedule of water rents adopted March 8, 1902, and now in operation, is working smoothly, demonstrating the wisdom of the elimination of objectionable features and the equitable adjustment of such items as work hardship.

Herewith I also desire to express my gratitude to the employees of this office for the efficient discharge of their varied duties, thereby aiding in carrying on the work of this department in a most gratifying manner.

Five tables are herewith submitted.

Very respectfully,

GEO. F. GREEN,  
Water Registrar.

Maj. JOHN BIDDLE.

Corps of Engineers, U. S. Army,  
Engineer Commissioner, District of Columbia.  
(Through Captain Harding.)

TABLE I.—Financial statement from July 1, 1901, to June 30, 1902.

<b>Revenues:</b>		
Balance to the credit of the water fund July 1, 1901.....		\$386,922.07
Schedule water rents.....	\$250,491.15	
Water-rent bills.....	58,013.24	
Water-main tax.....	65,962.47	
Taps.....	6,968.16	
Permits.....	1,760.58	
Miscellaneous.....	525.90	
Water-service connections.....	2,363.52	
		395,394.02
<b>Total.....</b>		<b>782,316.09</b>

# 112 OPERATIONS OF THE ENGINEER DEPARTMENT, D. C.

## Expenditures:

Salaries.....	\$30,503.35
Contingent expenses.....	2,685.39
Refunds.....	1,875.22
Pumping expense and pipe distribution.....	118,919.88
Extension of the high service.....	199,281.98
Purchase of water bonds.....	4,327.14
Purchase of water meters.....	285.00
On account of card system.....	1,118.58
On account of 1900.....	3,234.50
	362,231.04
Less repayments.....	32,472.19
	\$329,758.85
Balance July 1, 1902.....	452,567.21

TABLE II.—Comparative statement of revenues.

Fiscal year.	Water rents.	Water-main assessment.	Taps and stopcocks.	Permits, etc.	Total revenues.
1892.....	\$220,892.93	\$58,807.35	\$5,700.00	\$6,280.81	\$301,771.09
1893.....	235,911.25	70,026.33	7,307.09	7,931.71	321,176.38
1894.....	245,899.69	86,975.44	4,497.00	1,168.79	338,540.92
1895.....	251,872.71	72,972.24	4,537.55	2,100.60	331,483.10
1896.....	255,439.11	27,696.57	4,026.00	1,191.09	288,352.77
1897.....	253,500.16	53,653.39	5,157.00	1,128.28	313,438.83
1898.....	264,784.48	58,152.56	6,910.65	1,104.42	330,952.11
1899.....	276,065.54	62,937.43	6,327.00	1,545.15	346,875.12
1900.....	286,257.63	53,420.70	5,208.15	4,452.53	349,339.01
1901.....	303,557.19	56,359.72	6,140.85	3,064.39	369,122.15
1902.....	318,404.39	65,962.47	6,368.16	4,659.00	395,394.02
1903 <sup>a</sup> .....	325,000.00	60,000.00	7,000.00	2,000.00	394,000.00
1904 <sup>a</sup> .....	331,000.00	60,000.00	7,000.00	4,000.00	402,000.00

<sup>a</sup> Estimated.

TABLE III.—Statement of assessments and collections of water-main taxes from July 1, 1878, to June 30, 1902.

Fiscal year.	From July 1, 1878, to June 30, 1901.	1902.	Total.
Amount of water-main tax assessed.....	<sup>a</sup> \$1,297,822.20	\$42,410.00	\$1,340,232.20
Duplicate and overpayments.....	2,104.45	—	2,104.45
Six per cent abatement.....	29,822.85	—	29,822.85
Amount of water-main tax canceled.....	220,567.70	2,570.28	223,137.98
Amount of water-main tax collected.....	935,969.94	65,962.47	1,001,932.41
Amount of collectible water-main tax outstanding..	113,566.16	<sup>b</sup> 23,122.75	136,688.91

<sup>a</sup> Of this amount \$94,124.78 was outstanding and uncollected July 1, 1878.

<sup>b</sup> This amount is the excess of the amounts collected, canceled, and abated over the tax levied.

## RECAPITULATION.

Amount of assessments and duplicate payments.....	\$1,342,336.65
Amount of abatement at 6 per cent.....	29,822.85
Amount of water-main tax canceled.....	223,137.98
Amount of water-main tax collected.....	1,001,932.41
Amount of water-main tax outstanding July 1, 1902.....	136,688.91
	1,342,336.65

TABLE IV.—Premises in the District of Columbia supplied with Potomac water.

Number of dwellings to June 30, 1901.....	46,475
Introductions to June 30, 1902.....	1,326
Total.....	47,801

## MISCELLANEOUS UNMETERED WATER TAKERS.

Asylums.....	4
Bakeries.....	50
Boathouses.....	6
Banks.....	4
Barrooms.....	324
Barber shops.....	238
Freight depot.....	1
Railroad waiting station.....	1
Churches.....	60
Carpet-cleaning establishments.....	4
Dye houses.....	13
Dining and lunch rooms.....	149
Dairies.....	44
Engines, gas and steam.....	92
Factories.....	22
Flats.....	228
Foundries.....	2
Greenhouses.....	9
Hospitals.....	9
Halls.....	41
Ice companies.....	3
Laundries.....	213
Offices.....	413
Oyster depots.....	11
Photograph galleries.....	21
Schools.....	89
Pool rooms.....	41
Printing offices.....	20
Stables.....	825
Stores.....	2,682
Shops.....	306
Stone yards.....	10
Shooting galleries.....	6
Undertakers.....	17
Wood and coal yards.....	25
Warehouses.....	46

TABLE V.—Water meters.

	$\frac{1}{2}$ -in.	$\frac{3}{4}$ -in.	1-in.	1-in.	1 $\frac{1}{2}$ -in.	2-in.	3-in.	4-in.	6-in.	Regis- ters.	Total.
Worthington.....			3	13	14	23	16	4			73
Thomson.....	4	3	113	93	59	36	5	3	1		317
Crown.....	1		11	29	30	19	11	1	5		107
Union.....		1	43	50	12	12	1	1			120
Niagara.....				3	1	1					5
Lambert.....			40	12	16	6		1	1		76
Gem.....			1			5	8	1	1		16
Hersey Disc.....		1	1	1	4	4					11
Trident.....			3	3	2						8
Pittsburg.....		1	11	18	13	9	14				66
Registers.....										5	5
Nash.....	8	6	226	228	135	69	14	7	2		689
Total.....	13	12	452	450	286	178	69	18	10	5	1,493

## REPORT OF THE SUPERINTENDENT OF SEWERS.

WASHINGTON, September 15, 1902.

SIR: I have the honor to submit the following report of the operations of the sewer division for the fiscal year ending June 30, 1902:

Under the appropriation for cleaning and repairing sewers and basins the following-described work was performed:

*Sewers and appurtenances cleaned and repaired.*

## Cleaned:

Pipe sewers.....	feet.....	119,387
Main sewers.....	do.....	20,623
Manholes.....		14,477
Catch basins.....		117,752
Gravel basins.....		54
Basin outlets.....		74
Street detritus and sludge removed.....	cubic yards.....	10,408

# 114 OPERATIONS OF THE ENGINEER DEPARTMENT, D. C.

## Repaired:

Pipe sewers constructed .....	feet.....	430
Pipe sewers taken up and relaid .....	do.....	1,083
Main sewers repaired .....	do.....	982
Basins constructed .....		19
Basins reconstructed .....		37
Basins repaired .....		158
Flushing basins repaired .....		28
Basin tops replaced (artificial and bluestone) .....		56
Covers (cast iron) replaced .....		107
Basins abandoned .....		10
Manholes constructed .....		19
Manholes reconstructed .....		23
Manholes adjusted to grade .....		108
Manholes repaired .....		461
Manhole frames and covers replaced .....		91
Manholes covers replaced .....		130
Manholes abandoned .....		6
Flushing basins abandoned .....		1
Alley grates and frames replaced .....		65
Alley grates replaced .....		24
Alley basins repaired .....		44
Total number of minor repairs .....		493
Total number of jobs of all kinds performed .....		1,397

A section (550 linear feet) of new invert was constructed in the North Capitol street sewer between G and H streets. A contract was entered into with the Warren F. Brenizer Company for the construction of invert in the North Capitol street sewer between H and K streets. Forty-nine artificial basin tops were constructed. The outlets of Anacostia main sewers were cleaned. The outlet of the northeast boundary sewer was repaired.

Amount expended for cleaning catch-basins .....	\$11,230.90
Amount expended for manual flushing of sewers .....	6,958.94

The flushing gates at the outlet end of Tiber sewer were operated throughout the year with advantage to the sewer.

The tidal sewers and sediment chambers were cleaned as required.

Two flushing gangs were employed throughout the year flushing pipe sewers.

## MAIN AND PIPE SEWERS.

The sewer in M street NW. between Seventh and Ninth streets, and in square 424 was constructed by W. F. Brenizer under contract 2941. These two sewers were constructed under contracts for the fiscal year 1901.

Sewers were constructed, under contracts, in O street SW., between Delaware avenue and James Creek Canal, square 330, and Florida avenue NW., between Tenth and Eleventh streets, and in B street SW., between Sixth and Tenth streets.

There were constructed by day labor 7,569 linear feet of sewers, varying in size from 6 inches to 4½ feet diameter (43 manholes), divided among 41 jobs, the average length per job being 184.6 linear feet, the average cost per job being \$514.605.

The sewer in Sixteenth street NW., between K and L streets, and in K street NW., between Fifteenth and Sixteenth streets, under contract 2841 with Adam McCandlish, was completed by day labor. Fifteen linear feet pipe sewer and 8 linear feet of bell section were constructed, costing \$216.27, which was charged to the account of Adam McCandlish.

There were also constructed 89 catch-basins, 2,309 linear feet connections, varying in size from 8 to 24 inches in diameter, 6 manholes, and 40.5 linear feet gutter inlet, divided among 64 jobs, the average length of connection per job being 36 linear feet, the average cost per basin job being \$106.962.

## SUBURBAN SEWERS.

Sewers were constructed under contracts for the fiscal year 1901, in Nourse road, between Klinge Ford road and Connecticut avenue; Twenty-fourth street NW., between Massachusetts avenue and Bancroft; Howard avenue, between Anacostia River and Nicholas avenue; Nicholas avenue, from Howard avenue northward; Hartford street, between Ninth and Seventh streets, and Seventh

street, between Hartford and Galena streets, charged to the appropriation for suburban sewers, 1901.

Sewers were constructed under contracts in Eleventh street NW., between Florida avenue and Clifton street; Connecticut avenue, between Cathedral avenue and Rock Creek; west abutment of Massachusetts avenue bridge over Rock Creek, and Eighth street NE., between Hartford and Joliet streets.

There were constructed by day labor 5,609 linear feet pipe sewers, varying in size from 8 to 24 inches in diameter (39 manholes), divided among 36 jobs, the average length per job being 155.8 linear feet, the average cost per job being \$336.31.

#### ASSESSMENT AND PERMIT WORK.

*Permit work.*—There were constructed by day labor 9,212 linear feet of pipe sewers, varying in size from 8 to 21 inches in diameter (47 manholes), divided among 57 jobs, the average length per job being 161.6 linear feet, the average cost per job being \$244.013, and the average cost per foot being \$1.51.

*Assessment system.*—There were constructed by day labor 20,881 linear feet of pipe sewers, varying in size from 8 to 21 inches in diameter (87 manholes), divided among 65 jobs, the average length per job being 313.55 linear feet, the average cost per job being \$430.037, the average cost per foot being \$1.371; 12 catch-basins, 117 linear feet of pipe connections were constructed, divided among 11 jobs, the average length of connection laid per job being 10.64 linear feet, the average cost per job for basins constructed being \$96.72. Two catch-basins were abandoned.

#### AUTOMATIC FLUSHING TANKS.

Five flushing basins were constructed in various locations.

#### ARIZONA AVENUE SEWER.

The sewers in Arizona avenue, under contracts with W. F. Brenizer and R. A. Malone & Co., were completed. The trunk sewer in Arizona avenue is now complete from a point 900 feet north of the Potomac River to a point about 100 feet northward from Tunlaw road.

#### L STREET SEWER.

The sewer in L street NW., between Sixteenth and Twenty-first streets, under contract with P. D. Vinson, was completed.

#### REPLACING OBSTRUCTED SEWERS.

Under the appropriation for "Replacing obstructed sewers, 1901," the sewers in Thirteenth street SW., between B and D streets, Fourteenth street NW., between Rhode Island avenue and N street, and Twelfth street SW., between Virginia avenue and D street, aggregating 3,178 linear feet, were replaced under contracts.

On account of the death of contractor John Jacoby, the east side intercepting sewers, extension of Boundary sewer and the main sewer through the lands of Davidge and Trinity College were not completed.

Section A of the east side intercepting sewer was completed by day labor. New contracts were made for the completion of the other sewers as follows: Section B of the east side intersecting sewer with Andrew Gleeson; extension of the Boundary sewer with Arthur Cowsill, and main sewer through lands of Davidge and Trinity College, with M. F. Talty.

#### SEWAGE PUMPING PLANT.

The tide-gate chamber, outlet section, etc., were in course of construction under contract with Andrew Gleeson. Work still in progress at end of fiscal year.

The pumps and engines for the temporary pumping station were placed in position under contract by the Camden Iron Works.

#### LOW-AREA TRUNK SEWER.

There were constructed 1,007 linear feet of 3 feet 6 inches diameter sewer under contract with E. G. Gummell.

## SEWAGE-DISPOSAL PROJECT.

Under the appropriation for the "Preparation of detailed plans and specifications for sewage-disposal system complete," surveys for the various trunk sewers, the inverted siphon crossing the Anacostia River, and the pumping station have been completed. The surveys for land to be acquired for the construction of the outfall sewer have not been fully completed.

The sizes, gradients, and sections of the trunk sewers and inverted siphon have been designed and the estimates of cost have been made. Detailed sheets of the various portions of the work and specifications for the same are being prepared and they will be completed, in all probability, within the present fiscal year. The work upon the project has followed the general lines indicated in the report of the board of sanitary engineers of 1890, with such modifications as additional study of the situation indicated.

For example, the amount of rainfall to be provided for by the large trunk sewer in B street and New Jersey avenue has been increased, thereby increasing the size of that sewer and also the capacity of the pumping machinery at the pumping station.

The line has been changed from B street, eastward, at Tenth street, to avoid the crowded streets adjacent to the Center Market and the Pennsylvania Railway station, the new line crossing the Mall and joining the line originally proposed in Third street, near Maryland avenue. The outlet section of the Four-and-a-half street sewer has been changed in location from M street to L street. The location for the inverted siphon has been changed so that its axis is about normal with the proposed channel lines and its length has been considerably reduced. Several trunk lines have been added to the project. First, a trunk sewer to provide the properties within the low section of the city adjacent to Pennsylvania avenue NW., between First and Fifteenth streets, with adequate sewerage facilities for cellars. Second, the extension of the east side intercepting sewer from Twelfth street east to Twenty-first street. Third, the extension of the northeast Boundary sewer from its present outlet to a point near Twenty-first and A streets NE. Work is now in progress upon the east side intercepting sewer, the extension of the Boundary sewer, the lower section of the sewer to drain the low area and the outlet section of the Tiber Creek and New Jersey avenue high-level intercepting sewer.

A contract for furnishing the pumps, boilers, and appurtenances for the pumping station has been made with the Allis-Chalmers Company of Milwaukee.

Messrs. Didden & Vogt were engaged, after an open competition, as architects to prepare plans for the pumping station.

The estimated amount required to complete the project, in addition to the amounts heretofore appropriated, is \$2,168,097.50.

The expenditures to date on account of completed work aggregates \$520,473.04.

The appropriation to date on account of work in progress aggregates \$1,814,000.

Upon the subject of the construction of service sewers I again invite attention to the absence of equity in the charges against property benefited thereby. The benefit to any piece of property by the construction of a sewer bears no relation to the cost of the portion of the sewer adjacent to the property, because the size of the sewer is determined by the amount of drainage contributed, which varies, being small in amount at the upper end and increasing in volume until the discharge end is reached. Properties connected with the smaller portion of the sewer are as fully served thereby as properties connected with the sewer further down the line, where the size has been increased. It would impose an onerous burden upon the properties abutting upon the large sewers to assess the cost of the sewer construction against the property. To obviate this, the larger sewers are constructed from appropriations of the general funds and the abutting properties do not pay any share of the cost, although they receive the same amount of benefit as properties which abut upon the smaller sewers. The frontage of the property upon the line of sewer does not afford a fair measure of the benefit, because as full and ample service may be secured if the sewer abuts a few feet upon the property as if the sewer abuts upon the whole frontage.

The area of the property served seems to afford the best measure of the value of the sewer service, because one of the main purposes of the sewer is to remove storm water, the amount of which varies directly with the area drained. For the average lot the rate of 1 cent per square foot of surface would represent the average cost of a sewer along the front of the lot which would be of proper size for its service; this rate is, therefore, recommended as a reasonable rate to apply to the assessment of all lots provided with access to the sewer system.

I would respectfully suggest that it would be a material help to the work of the office if the construction appropriations were so made that they would be available until expended instead of lapsing with the fiscal year. There is no apparent advantage in the present arrangement, and many disadvantages. I also suggest that an effort be made to raise the limit of expenditure permissible by day labor from \$1,000 to \$3,000. This is especially desirable for emergency and repair work.

TABLES.

- Table 1 shows work performed under contracts.  
 Table 2 shows work performed under permit system.  
 Table 3 shows work performed under assessment system.  
 Table 4 shows work performed at the whole cost of the applicant.  
 Table 5 shows work performed by day labor charged to appropriation, main and pipe.  
 Table 6 shows work performed by day labor charged to appropriation, suburban.  
 Table 7 shows work performed by day labor charged to various appropriations.  
 Table 8 shows average cost per foot of sewers and the average cost of basins constructed by day labor.  
 Table 9 shows number of inspectors, foremen, and other employees of the sewer division, the offices of the chief clerk of the engineer department, disbursing officer, inspector of asphalts and cements, and the engineer department stables, temporarily employed, and the appropriations from which these employees were paid for the fiscal year ending June 30, 1902.  
 Table 10 shows the number of electric conduits laid during the fiscal year and the number of feet of electric conduits in use June 30, 1902.

RECAPITULATION.

Length of sewers constructed in the fiscal year 1902:	Miles.
Main sewers, 17,342 linear feet .....	3.284
Pipe sewers, 52,520 linear feet .....	9.947
Total sewers constructed .....	13.231
<hr/>	
Total length of sewers, June 30, 1902:	
Main sewers .....	93.494
Pipe sewers .....	338.127
Total .....	431.621

Very respectfully, your obedient servant,

D. E. McComb,  
*Superintendent of Sewers.*

Maj. JOHN BIDDLE,  
*Corps of Engineers, U. S. Army,*  
*Engineer Commissioner, District of Columbia.*  
 (Through Captain Harding.)

TABLE 1.—Statement of sewers constructed under contracts

No. of contract.	Contractor.	Location.	Size of sewer.	Length of sewer.	Contract price per foot.
				<i>Feet.</i>	
2942	P. D. Vinson .....	North Capitol street, between G and K streets.	10 feet diameter invert. 8 feet diameter invert. Transition section.	237.5 300 12.5	
2940	Lyons Bros .....	Thirteenth street SW., between B and D streets.	21-inch pipe .....	223.4	\$0.90
2940	.....do .....	Fourteenth street NW., between Rhode Island avenue and N street.	18-inch pipe .....	207.8	.85
			12-inch pipe .....	275.8	.71
			15-inch pipe .....	274.4	.75
			12-inch pipe .....	298	.71
			10-inch pipe .....	407	.64
2941	W. F. Brenizer .....	Twelfth street SW., between Virginia avenue and D street.	18-inch pipe .....	530	.74
			15-inch pipe .....	241.7	.69
			12-inch pipe .....	540	.62
2841	Adam McCandlish.	Sixteenth street, between K and L streets, and K street, between Fifteenth and Sixteenth streets.	2 feet 4 inches by 2 feet 8 inches. 24-inch pipe .....	709 301.4	
			Bell section .....	8	
2941	W. F. Brenizer .....	M street NW., between Seventh and Ninth streets, and in square 424.	21-inch pipe .....	287.2	.81
			18-inch pipe .....	148.2	.70
			15-inch pipe .....	255.6	.71
			12-inch pipe .....	282.9	.62
2908	J. P. Larguey .....	Nourse road, between Klinglie road and Connecticut avenue.	15-inch pipe .....	2,520.6	.60
2908	.....do .....	Twenty-fourth street, between Massachusetts avenue and Bancroft street.	2.5 by 3.75 .....	440.3	
		Howard avenue, between Anacostia River and Nichols avenue.	24-inch pipe .....	1,898	1.00
2910	John Jacoby .....	Nichols avenue from Howard avenue northward.	15-inch pipe .....	270	.85
2939	R. A. Malone & Co.	Hartford street, between Ninth and Seventh streets, and Seventh street, between Hartford and Galena streets.	3.25 by 4.875 .....	349.2	2.00
			24-inch pipe .....	343.3	2.00
			21-inch pipe .....	333.7	2.00
2837	W. F. Brenizer .....	Arizona avenue .....	9 feet diameter .....	2,061	
			8 feet 9 inches diameter.	1,228.4	
2743	John Jacoby .....	East side intercepting sewer, between Twenty-second and A streets NE. and Twelfth and M streets SE.	24-inch pipe .....	72	
			6 feet 3 inches diameter.	1,402	
			6 feet diameter .....	1,181	
2743	.....do .....	East side intercepting sewer, between Twelfth and M streets SE. and pumping station.	6 feet 3 inches diameter.	4,041.9	
			Bell section .....	16.6	
			5 feet 9 inches diameter.	6.6	
2870	P. D. Vinson .....	L street NW., between Twenty-first and Sixteenth streets.	5 feet 6 inches diameter.	1,400.2	
			5 feet 3 inches diameter.	501	
3043	James A. Coyle .....	O street SW., between Delaware avenue and James Creek Canal.	24-inch pipe .....	413.7	.80
3043	.....do .....	Square 330 and Florida avenue between Tenth and Eleventh streets.	21-inch pipe .....	721.9	.80
3043	.....do .....	Eleventh street NW., between Florida avenue and Clifton street.	18-inch pipe .....	567.45	.80
3044	W. F. Brenizer .....	Connecticut avenue, between Cathedral avenue and Rock Creek.	4 feet diameter .....	285	
			2.75 by 4.125 .....	1,526.5	
			2 by 3 .....	919	
3048	Lyons Bros .....	West abutment Massachusetts avenue bridge over Rock Creek.	4 feet 3 inches diameter.	322.4	

<sup>a</sup>Includes \$9.25, cost of cleaning sewer by District of Columbia employees, charged to contractor.

<sup>b</sup>Includes \$114 charged to contractor.

<sup>c</sup>Includes \$216.27, cost of completing sewer by District of Columbia employees, charged to contractor.

<sup>d</sup>Includes work previously reported upon.

<sup>e</sup>Includes \$124 charged to contractor.

chargeable to appropriations for fiscal years 1901 and 1902.

Allowance to contractor.	Material furnished.		Cost of inspection.	Cost of repairs to pavements.	Total cost.	Appropriations.
	Chargeable.	Not chargeable.				
\$5,177.31	\$974.80	\$30.19	\$212.00	-----	\$6,394.30	Cleaning and repairing sewers and basins, 1901.
1,682.77	106.62	403.98	86.00	<sup>a</sup> \$126.79	2,405.16	Replacing obstructed sewers, 1901.
1,774.08	90.00	276.14	74.00	572.84	2,787.10	Do.
2,197.62	129.63	459.84	154.00	304.33	3,244.92	Do.
2,960.08	985.63	238.00	<sup>b</sup> 290.00	<sup>c</sup> 1,000.23	<sup>d</sup> 5,532.94	Main and pipe sewers, 1901.
1,728.61	117.60	434.85	94.00	219.41	2,594.47	Do.
2,414.69	297.21	790.84	224.00	42.36	3,768.60	Suburban sewers, 1901.
2,342.49	600.25	11.55	396.00	-----	3,290.29	Do.
3,455.11	366.41	1,639.78	412.00	138.19	6,011.49	Do.
3,404.70	688.26	465.93	<sup>e</sup> 124.00	-----	4,682.89	Do.
33,082.28	15,823.26	279.81	1,214.25	-----	<sup>d</sup> 50,399.60	Arizona avenue sewer.
31,218.48	3,419.10	-----	2,319.50	<sup>f</sup> 87.80	<sup>g</sup> 37,044.88	{ East side intercepting sewer between Twenty-second and A streets NE. and Twelfth and M streets SE.
65,863.37	6,240.80	-----	3,226.62	<sup>h</sup> 2,130.40	<sup>j</sup> 77,461.19	
14,372.04	5,264.96	60.40	<sup>i</sup> 954.00	<sup>j</sup> 8,454.19	<sup>d</sup> 29,105.59	L street sewer.
462.85	48.00	363.12	138.25	-----	1,012.22	Main and pipe sewers, 1902.
1,139.26	71.25	471.20	230.00	5.62	1,917.33	Do.
747.35	56.46	252.34	125.50	-----	1,182.05	Suburban sewers, 1902.
11,899.87	3,464.68	46.73	598.00	-----	16,009.28	Do.
3,375.80	725.62	1.44	<sup>k</sup> 180.00	-----	8,528.28	Do.

<sup>f</sup>Cost of removing water main at Twelfth and M streets SE., charged to contractor.

<sup>g</sup>Work incomplete; payment made on account.

<sup>h</sup>Charged to contractor; includes cost of repairs to car tracks on M street SE.

<sup>i</sup>Includes \$118 charged to contractor.

<sup>j</sup>Includes \$1,141.79 charged to contractor.

<sup>k</sup>Includes \$102 charged to contractor.

TABLE 1.—*Statement of sewers constructed under contract*

No. of contract.	Contractor.	Location.	Size of sewer.	Length of sewer.	Contract price per foot.
2889	John Jacoby.....	Extension of boundary.....	22 by 23½ feet invert.	<i>Feet.</i> 636	
			8 feet 6 inches diameter.	502	
2939	R. A. Malone & Co.	Arizona avenue.....	8 feet 8 inches diameter.	1,193.4	
			8 feet diameter ..	1,507.6	
			7 feet 8 inches diameter.	798.5	
			7 feet diameter ..	401.9	
			Tide-gate chamber.	103.06	
			12 feet by 10 feet 6 inches, D-shape.	471.29	
2993	Andrew Gleeson ..	(Second street SE., between N street and Anacostia River.	Transition section.	50	
			14 feet by 14 feet 8 inches, D-shape.	55.06	
			8 feet 9 inches diameter.	892	
3044	W. F. Brenizer.....	(B street, between Sixth and Tenth streets SW.	3 feet 6 inches diameter.	580	
3065	.....do.....	(Eighth street NE., between Hartford and Joliet streets.	2.5 by 3.75 .....	372	
			2 by 3 .....	388	
3037	E. G. Gummel.....	Low-area trunk sewer (New Jersey avenue, between First and N streets SE.).	24-inch pipe .....	249	
			3 feet 6 inches diameter.	1,007	
2997	Camden Iron Works.	Second street and Georgia avenue SE.	Pumping plant ..		
3068	M. F. Talty.....	Through lands of W. D. Davidge and Trinity College.	5 feet 9 inches.....	200	
			5-foot 9-inch sewer.	362	
2985	John Jacoby.....	do.....	5-foot 9-inch invert.	226	
			6-foot sewer.....	729	
			6-foot invert.....	43	

<sup>a</sup> Includes work previously reported upon.<sup>b</sup> Work incomplete; payment made on account.<sup>c</sup> Includes \$12 charged to contractor.

OPERATIONS OF THE ENGINEER DEPARTMENT, D. C. 121

able to appropriations for fiscal years 1901 and 1902—Continued.

wance con- ctor.	Material fur- nished.		Cost of inspec- tion.	Cost of repairs to pave- ments.	Total cost.	Appropriations.
	Charge- able.	Not charge- able.				
653.39	\$6,408.61	-----	\$843.50	-----	(a b)	Extension of boundary sewer.
619.01	13,249.43	\$317.78	1,523.25	-----	\$51,709.47	Arizona avenue, 1902.
395.10	18,225.40	-----	2,104.50	-----	b 79,725.00	Sewage pumping plant, 1901.
124.95	1,501.33	22.91	404.00	d 2,221.46	10,334.65	Main and pipe sewers, 1902
908.21	1,104.87	215.28	156.00	-----	4,474.36	Suburban sewers, 1902.
578.90	1,779.10	-----	848.00	-----	b 17,206.00	Low-area trunk sewer.
598.50	-----	-----	-----	-----	b 9,596.50	Sewage pumping plant.
330.29	861.30	-----	100.00	-----	b 3,291.59	Main through lands of W. D. Da- vidge and Trinity College.
514.15	2,098.30	-----	520.00	-----	9,127.45	Do.

d Includes \$56.85 charged to contractor.

e Includes \$15.95, cost of ash pit under boiler.

TABLE 2.—Statement of sewers laid under the appropriation for assessment

VOLUNTARY

No. of order.	Location.	Pipe sewers laid (length in feet).							Main lines.	Branches.
		8-inch.	10-inch.	12-inch.	15-inch.	18-inch.	21-inch.	24-inch.		
29	Blair road, from Chestnut avenue northward.	-----	743	-----	-----	-----	-----	-----	3	10
36	Block 7, Bloomingdale .....	16	-----	-----	-----	-----	-----	-----	-----	2
39	Block 9, Bloomingdale .....	16	-----	-----	-----	-----	-----	-----	-----	-----
48	Brightwood avenue, between Omaha street and Philadelphia avenue.	-----	192	-----	-----	-----	-----	-----	1	3
52	Brown street, from Howard street northward.	-----	-----	205	-----	-----	-----	-----	-----	5
	Connecticut avenue, between Nourse and Pierces Mill roads. <sup>b</sup>	-----	684	648	1,257	-----	-----	-----	9	-----
1	Detroit street NE., from North Capitol street eastward.	-----	-----	-----	-----	117	-----	-----	-----	-----
6	Duncan street NE., between Fourteenth and Fifteenth streets.	-----	-----	361	-----	-----	-----	-----	1	8
5	Eighteenth street NW., between N and O streets.	-----	-----	176	-----	-----	-----	-----	1	1
17	Eighteenth street NW., between R and Riggs streets.	80	-----	-----	-----	-----	-----	-----	2	4
34	Eleventh street NW., between Clifton and Roanoke streets.	-----	-----	223	-----	-----	-----	-----	-----	4
2	Fifth street NE., between V and W streets.	-----	-----	59	-----	-----	-----	-----	1	1
3	First street NW., between U and V streets.	-----	116	-----	-----	-----	-----	-----	1	7
7	Florida avenue NE., between New York avenue and First street.	-----	160	-----	-----	24	-----	-----	1	2
9	Square 54 .....	-----	94	-----	-----	-----	-----	-----	1	5
15	First street NW., between Randolph and S streets.	-----	76	-----	-----	-----	-----	-----	1	4
26	Square 529 .....	-----	53	-----	-----	-----	-----	-----	-----	3
27	First street NW., between Randolph and S streets.	-----	96	-----	-----	-----	-----	-----	-----	6
37	First street NW., between V and W streets.	-----	-----	346	-----	-----	-----	-----	1	17
50	First street NW., between Albany and Baltimore streets.	-----	-----	313	-----	-----	-----	-----	1	17
51	Square 509 .....	-----	-----	91	-----	-----	-----	-----	-----	5
56	Fourteenth street NE., between F and G streets.	-----	-----	148	18	-----	-----	-----	2	12
43	Kalorama avenue NW., between Eighteenth street and Columbia road.	-----	100	-----	-----	-----	-----	-----	-----	2
40	L street NE., between North Capitol and First streets.	-----	-----	234	-----	-----	-----	-----	1	-----
53	Lamar place, between Eslin avenue and Thirteenth street.	-----	-----	145	-----	-----	-----	-----	-----	2
33	Milwaukee street NW., between Wisconsin avenue and Thirty-sixth street.	259	-----	-----	-----	-----	-----	-----	-----	8
11	Nineteenth street NW., between R and S streets.	-----	102	-----	-----	-----	-----	-----	2	3
12	Ninth street NW., between D and E streets.	-----	100	-----	-----	-----	-----	-----	-----	5
20	North Capitol street, between Randolph and S streets.	-----	-----	99	-----	-----	-----	-----	1	6
21	North Capitol street, between Pierce and M streets.	-----	106	-----	-----	-----	-----	-----	1	2
35	North Capitol street, between Seaton and T streets.	-----	96	-----	-----	-----	-----	-----	1	4
38	North Capitol street, between R and Randolph streets.	-----	-----	205	-----	-----	-----	-----	1	5
8	O street NW., between Twenty-eighth and Twenty-ninth streets NW.	14	-----	-----	-----	-----	-----	-----	-----	1
14	O street NW., between North Capitol and First streets.	-----	-----	11	-----	-----	-----	-----	-----	1
24	Ohio avenue, between Twelfth and Thirteenth streets NW.	-----	-----	26	-----	-----	-----	-----	-----	1
28	R street NW., between First and North Capitol streets.	-----	11	-----	-----	-----	-----	-----	-----	1

<sup>a</sup> Balance carried forward to job 35 permit.<sup>b</sup> Constructed under contract 2909 by M. F. McNamara & Co.<sup>c</sup> Includes work previously reported upon. Work begun in fiscal year 1901; completed in fiscal year 1902.

# OPERATIONS OF THE ENGINEER DEPARTMENT, D. C. 123

and permit work and whole cost to applicant for fiscal year 1902.

## SYSTEM.

Amount of deposit.	Cost to District of Columbia.	Cost to applicant.	Total cost.	Amount returned.	For whom done.	Overseer.	Date of completion.
\$578.21	\$578.21	\$578.21	\$1,156.42		L. P. Shoemaker	Ward	Jan. 24, 1902
12.00	6.81	6.81	13.62	\$5.19	Middaugh & Shannon	Lanigan	Feb. 17, 1902
12.00	7.33	7.34	14.67	4.66	do	do	Feb. 27, 1902
160.00	129.15	129.16	258.31	30.84	Mrs. Mary Heine	Ward	May 16, 1902
235.00	135.22	135.23	270.45	99.77	G. S. Cooper	do	June 2, 1902
5,691.00	3,821.59	3,821.59	7,643.18	1,869.41	E. J. Stellwagen	Lamb Weller Pierce	May 17, 1902
175.00	175.00	175.00	350.00		Geo. W. Bulloch	Prince	Nov. 2, 1901
\$381.10	363.83	363.83	727.66	17.27	H. N. Taplin	Thomas	July 29, 1901
219.54	219.54	219.54	439.08		Mrs. E. H. G. Slater	Condon Prince	Nov. 25, 1901
85.00	85.00	85.00	170.00		John H. Noland	Thomas	Dec. 31, 1901
190.00	181.59	181.59	363.18	8.41	C. Schneider's Sons	Lanigan	Feb. 12, 1902
70.00	43.41	43.41	86.82	26.59	Jno. Wirschusen	do	July 3, 1901
80.00	64.12	64.13	128.25	15.87	Middaugh & Shannon	Ward	Aug. 29, 1901
171.00	139.40	139.40	278.80	31.60	Michael Esch	Prince	Sept. 30, 1901
77.00	68.29	68.30	136.59	8.70	T. F. Schneider, president.	Ward	Oct. 2, 1901
70.00	69.76	69.75	139.51	.25	F. A. Blundon	do	Dec. 7, 1901
35.00	35.00	35.00	70.00		Isabelle Lenman	Prince	Apr. 23, 1902
98.00	82.19	82.20	164.39	15.80	Middaugh & Shannon	Ward	June 2, 1902
290.00	278.40	278.39	556.79	11.61	E. Speich	do	Mar. 1, 1902
265.00	187.45	187.46	374.91	77.54	Middaugh & Shannon	Prince	May 29, 1902
100.00	89.87	89.87	179.74	10.13	Harry Wardman	do	July 31, 1902
160.00	149.22	149.21	298.43	10.79	S. B. Priest	do	July 21, 1902
80.00	70.43	70.43	140.86	9.57	T. C. Noyes	do	Apr. 5, 1902
200.00	150.96	150.97	301.93	49.06	Washington Sanitary Improvement Co.	Ward	June 24, 1902
115.00	85.05	85.05	170.10	29.95	John Levy	do	June 4, 1902
145.00	145.00	145.00	290.00		Thos. J. Fisher & Co.	Thomas	Jan. 24, 1902
149.00	99.45	99.46	198.91	49.54	Theo. Harding	Prince	Oct. 30, 1901
122.50	75.80	75.81	151.61	46.69	C. C. Duncanson	do	Do.
95.00	82.67	82.66	165.33	12.34	Middaugh & Shannon	Ward	Dec. 17, 1901
95.00	80.07	80.08	160.15	14.92	Mrs. C. B. Fisk, president.	do	June 27, 1902
\$91.19	87.46	87.47	174.98	3.72	Middaugh & Shannon	Lanigan	Mar. 21, 1902
180.00	179.17	179.16	358.33	.84	do	do	June 21, 1902
10.00	10.00	10.00	20.00		Calvin Payne	Prince	Aug. 23, 1901
9.00	5.70	5.70	11.40	3.30	Terrell Pattison	Ward	Sept. 26, 1901
22.50	16.88	16.37	32.75	6.13	Theo. Schondau	Prince	Nov. 22, 1901
10.00	9.17	9.17	18.34	.83	Geo. R. Ferguson	do	Dec. 24, 1901

d Balance, \$61.10, brought forward from job 301. W. cost.

e Includes cost of repairs to pavements charged to the appropriation for the fiscal year 1902.

f For Washington Heights Presbyterian Church.

g \$5.19 brought forward from job 93 permit.

TABLE 2.—Statement of sewers laid under the appropriation for assessment  
VOLUNTARY

No. of order.	Location.	Pipe sewers laid (length in feet).							Manholes.	Branches.
		8-inch.	10-inch.	12-inch.	15-inch.	18-inch.	21-inch.	24-inch.		
45	Randolph street NW., from Connecticut avenue eastward.	651							2	9
46	do	640							2	11
31	Sheridan street NW., between Piney Branch road and eastward.		123						1	6
10	Sixth street NE., between H and I streets.			44						1
13	Square 358		22							2
18	Thirty-fifth street NW., between Woodley road and Pierrepont street.		320						2	4
19	Twenty-first street NW., between P street and Massachusetts avenue.			39					1	
23	Third street NE., between Seaton and T streets.			161					2	1
25	Square 254			35						1
32	Thirteenth street SW., between Band O streets.		124							2
41	Third street NW., between Indiana avenue and O streets.		152							4
47	Twenty-second street NW., between M and N streets.			17						1
49	Third street NW., between Seaton and S streets.		98	18					1	4
55	Thirty-first street NW., between Dumbarton avenue and O street.			118					1	5
57	U street NW., between Valley and Thirty-second streets.			32						1
58	Block 7, Washington Heights									
16	Wisconsin avenue, between Woodley road and Pierrepont street.	171							21	3
54	Pennsylvania avenue NW., between Twelfth and Thirteenth streets.			130						5
4	Quincy street NE., from Third street westward.			11						1
22	Q street NW., between Twenty-second and Twenty-third streets.		35							1
42	Quincy street eastward from Connecticut avenue.	480							2	
44	do	515							3	10
Total		2,842	3,609	3,722	1,451	24	117		56	39

a Balance brought forward from job 44.

b Balance carried forward to job 46.

c Balance brought from job 45.

d Includes cost of repairs to pavements charged to the appropriation for the fiscal year 1901.

e Balance carried forward to fiscal year 1903.

f Work completed in fiscal year 1903.

# OPERATIONS OF THE ENGINEER DEPARTMENT, D. C. 125

and permit work and whole cost to applicant for fiscal year 1902—Continued.

SYSTEM—Continued.

Amount of deposit.	Cost to District of Columbia.	Cost to applicant.	Total cost.	Amount returned.	For whom done.	Overseer.	Date of completion.
(a)	\$507.02	\$507.03	\$1,014.05	(b)	E. J. Stellwagen	Ward	May 5, 1902
(c)	509.05	509.05	1,018.10	\$273.45	do	do	May 10, 1902
\$117.68	117.67	117.68	235.35		Chas. Schneider	Thomas	Jan. 9, 1902
30.00	17.03	17.04	34.07	12.96	Stetson & Rhineland	Ward	Aug. 27, 1901
24.00	17.51	17.51	35.02	6.49	Albert McIntosh	Thomas	Oct. 11, 1901
255.00	199.07	199.07	398.14	55.93	Thos. J. Fisher & Co.	Ward	Oct. 24, 1901
46.00	45.02	45.02	90.04	.98	Thos. F. Walsh	Prince	Nov. 26, 1901
175.00	127.02	127.03	255.85	47.07	L. D. Meline	do	Mar. 25, 1902
40.00	24.74	24.75	49.49	15.25	J. B. Lerner	do	Dec. 28, 1901
79.00	71.71	71.71	143.42	7.29	S. L. Phillips	Lanigan	June 16, 1902
145.00	89.62	89.63	179.25	15.37	S. S. Lutz	do	Apr. 25, 1902
15.00	15.00	15.00	30.00		Mendenhall & Waters	do	May 8, 1902
100.00	69.55	69.56	130.11	30.44	L. D. Meline	Prince	May 17, 1902
144.00	105.84	105.84	211.68	38.16	W. D. Sullivan	do	June 13, 1902
40.00	29.37	29.37	48.74	10.63	L. D. Smoot	do	July 17, 1902
50.00	10.40	10.40	20.80	(c)	Maj. Frank Wheaton	do	(f)
115.00	167.42	95.97	263.39	19.03	Eleanor H. Griffin et al.	Ward	Oct. 17, 1901
150.00	107.67	107.67	215.34	42.33	Stilson Hutchins	do	Aug. 13, 1902
9.00	9.00	9.00	18.00		Washington Sanitary Improvement Co.	Lanigan	July 2, 1901
27.50	19.10	19.10	38.20	8.40	R. A. Chester	Prince	Nov. 16, 1901
1,833.75	236.13	236.13	472.26	(i)	E. J. Stellwagen	Ward	Apr. 3, 1902
(j)	338.00	338.00	616.18	(k)	do	do	Apr. 12, 1902
13,834.97	10,811.62	10,740.30	21,551.92	3,055.07			

<sup>a</sup>Cost of manhole, \$71.45, charged to appropriation for cleaning and repairing sewers and basins, 1902, and repaid to appropriation for assessment and permit work, 1902.

<sup>b</sup>Includes \$51.72, cost of repairs to pavements made in fiscal year 1903.

<sup>c</sup>Balance carried forward to job 44.

<sup>f</sup>Balance brought forward from job 42.

<sup>k</sup>Balance carried forward to job 45.

## 126 OPERATIONS OF THE ENGINEER DEPARTMENT, D. C.

TABLE 3.—Statement of sewers laid under the appropriation for assessment

## ASSESSMENT

No. of order.	Location.	Pipe sewers laid (length in feet).					
		8-inch.	10-inch.	12-inch.	15-inch.	18-inch.	21-inch.
140	Canal street, property yard.....						
118	Adams Mill road, between Lanier avenue and Columbia road.....		176				
136	A street SE., between Fifteenth and Sixteenth streets.....			171.5			
100	Carroll avenue, between Maple avenue and Baltimore and Ohio Railroad.....	600					
189	Canal street SW., between First and Second streets.....			315			
143	Central avenue NW., between Erie and Huron streets.....			150	150	210	
146	C street SE., between Twelfth and Thirteenth streets.....		217	148			
170	California avenue, between Connecticut avenue and Phelps place (north side).....			330.5			
171	California avenue, between Connecticut avenue and Phelps place (south side).....			346.28			
112	Dumbarton avenue NW., between Thirtieth and Thirty-first streets.....			305			
145	D street SE., between Thirteenth and Fourteenth streets.....		117				
111	E street SE., between Sixteenth and Seventeenth streets.....			341.5			
125	Eighth and K streets NW. (northeast corner).....						
173	Eighth street NW., between Trenton and Utica streets.....		188				
176	Eighth street NW., between Des Moines and Erie streets.....	392.3					
107	First and B streets NE. (northeast corner).....			3			
108	Fourteenth and E streets SE. (southwest corner).....			20			
109	Four-and-a-half and L streets SW. (northwest corner).....		6				
126	Fifteenth and East Capitol streets (southwest corner).....		15				
124	Fourteenth and N streets NW. (northeast corner).....						
130	Fifth and M streets NW. (southeast corner).....			27			
133	Block 1, Fairview Heights.....	300					
134	Square 582.....			245			
138	Fourteenth and H streets NW. (northwest corner).....			33			
148	Fourth street NE., between V and W streets.....			340			
151	Fourteenth street NE., between Providence and Lansing streets.....		300				
161	First and V streets NW. (northeast corner).....						
162	Square 567.....		63				
165	F street, between Thirteenth and Elliott streets NE.....			181.35			
172	Florida avenue NE., between Twelfth and Thirteenth streets.....			285.9			
129	G street SW., between Sixth and Seventh streets.....		145				
144	Grant street, between Nichols avenue and Arthur street (Anacostia).....		91	172			
	Harvard street, between Sherman and Brightwood avenues NW.....					810.3	
113	Harvard street NW., between Eleventh and Thirteenth streets.....			306			
114	do.....		183				
152	Half street SE., between L and M streets (west side).....		275				

<sup>a</sup> 27 corner and 27 side artificial basin tops constructed.

<sup>b</sup> Work begun in fiscal year 1901.

<sup>c</sup> Repairs to pavements made in fiscal year 1903 included in cost of work.

<sup>d</sup> The excessive cost of this work was due to the large amount of rock excavation.

# OPERATIONS OF THE ENGINEER DEPARTMENT, D. C. 127

permit work and whole cost to applicant for fiscal year 1902—Continued.

CEM.

ns r- ct.	Manholes.	Branches.	Cost to Dis- trict of Columbia.	Cost to property owners.	Total cost.	Overseers.	Date of com- pletion.
	1	4	\$90.46	\$90.45	\$230.58	Thomas	Jan. 27, 1902
					196.91	Ward	Aug. 16, 1901
		10	95.74	95.75	191.49	Thomas	Nov. 6, 1901
	2	19	316.63	316.64	633.27	Prince	July 12, 1901
	2	3	233.83	233.84	467.67	Ward	Oct. 27, 1901
	3	5	532.56	532.57	1,065.13	do.	Dec. 10, 1901
	2	18	291.54	291.55	583.09	Thomas	Dec. 12, 1901
	2	2	267.23	267.22	534.45	Ward	July 21, 1901
	2	3	301.34	301.35	602.69	do.	Do. <sup>c</sup>
	2	7	494.92	494.93	989.85	Prince	Oct. 21, 1901
	1	8	107.91	107.91	215.82	Thomas	Mar. 14, 1902
	2	8	252.24	252.25	504.49	Ward	Oct. 8, 1901
1					58.80	Lanigan	Sept. 29, 1901
	1	5	102.90	102.90	205.96	Ward	June 12, 1902
	2	19	203.18	203.18	406.36	do.	June 18, 1902
1					58.81	Lanigan	Aug. 1, 1901
1					79.62	do.	Sept. 11, 1901
1					56.60	do.	July 27, 1901
1					71.53	do.	Sept. 30, 1901
					ef 371	do.	Sept. 28, 1901
1					88.55	do.	Oct. 30, 1901
	1	12	130.63	130.64	261.27	Ward	Oct. 19, 1901
	1	6	157.62	157.63	315.25	do.	Oct. 12, 1901
1					110.79	Lanigan	Nov. 22, 1901
	1	1	179.00	179.00	358.00	Prince	Dec. 15, 1901
	1	6	297.73	297.74	595.47	do.	Jan. 16, 1902
1					50.85	Lanigan	Apr. 5, 1902
		6	46.84	46.85	93.69	do.	Apr. 25, 1902
	1	2	151.93	151.92	303.85	Thomas	May 5, 1902
		5	144.22	144.22	288.44	Ward	June 30, 1902
	1	5	106.30	106.31	212.61	Prince	Oct. 26, 1901
	2	4	184.52	184.52	369.04	do.	Mar. 14, 1902
	2	22	947.29	947.30	o 1,894.59	Beach	Oct. 11, 1901
	2	11	383.11	383.12	766.23	Thomas	Aug. 26, 1901
	1	11	255.13	255.14	510.27	do.	Sept. 4, 1901
	1	5	154.04	154.03	308.07	Lanigan	Mar. 27, 1902

<sup>c</sup> Work performed at request of surface department.

<sup>f</sup> One catch basin abandoned.

<sup>o</sup> Work performed under contract No. 3009 by Lyons Bros.

TABLE 3.—Statement of sewers laid under the appropriation for assessment

ASSESSMENT

No. of order	Location.	Pipe sewers laid (length in feet).					
		8-inch.	10-inch.	12-inch.	15-inch.	18-inch.	21-inch.
153	Half street SE., between L and M streets (east side).		275.8				
164	Harwood avenue, between Maple avenue and Spruce street.		69	94			
175	Half street SE., between I and K streets.			256			
179	Half street SE., between K and L streets (east side).		186				
157	Half street SW., between O and P streets.			290			
160	Highland avenue, west of Connecticut avenue.	404					
161	Jackson street, between Pierce and Adams streets (Anastasia).			360			
162	Jefferson, from Taylor street eastward.			267.4	183.5		
166	Jackson street, between Pierce and Adams streets.			505			
129	I street NE., between Tenth and Eleventh streets.			108.5			
166	Ingraham street, between Brightwood avenue and Thirteenth street.		186				
127	Kenesaw avenue, between Sixteenth and Eighteenth streets NW.			264			
132	Kenesaw avenue, between Fifteenth and Sixteenth streets SW.			80.5			
177	Kentucky avenue, between D and E streets SE.		201.5	198.5			
110	Lansing street (Brookland), between Thirteenth and Fourteenth streets.		236.5				
159	do.	323.5					
158	Lincoln avenue NE., between Randolph and S streets.			208			
174	Lowell street NW., between Seventeenth and Eighteenth streets.		181	162.5			
115	M street NE., between North Capitol and I streets (south side).			402			
116	do.		304.5				
141	Massachusetts avenue, from Tenth street westward NW.		111				
119	Morgan avenue NW., between Lamar place and Spring road.					180	15
163	New York avenue, between Twenty-first street and Virginia avenue NW.			172			
165	New Jersey avenue, between D and E streets SE.			108.5			
	Princeton street NW., between Brightwood and Sherman avenues.			787.5			
149	Providence street NE., between Thirteenth and Fourteenth streets.			600			
131	R street, between Thirteenth and Fourteenth streets NW.						
147	Rock Creek Church road, between Whitney avenue and Spring road.			150	482.5		
156	Randolph street NW., between North Capitol and I streets.		138.4	170			
175	Rock Creek Church road, between New Hampshire avenue and Eighth street.			135			
122	Seventh street and Rhode Island avenue (southwest corner).						
142	Scott street NW., between Valley and Canton streets.		208.5				
159	Seventh street NW., between Vermilion and Umatilla streets.	151.5					
135	Sixteenth street SE., between A and B streets.					304	
155	Sixth street NW., between K street and Massachusetts avenue.		85.8				
163	Sixth and K streets NE. (northeast corner).					3	
169	South street NW., between Thirty-first and Thirty-second streets.		290				
117	Twenty-ninth street NW., between Q and Roads street.			117			

a Work performed under contract No. 3009 by Lyon Bros.

# OPERATIONS OF THE ENGINEER DEPARTMENT, D. C. 129

permit work and whole cost to applicant for fiscal year 1902—Continued.

EM—Continued.

as to	Manholes.	Branches.	Cost to Dis- trict of Columbia.	Cost to property owners.	Total cost.	Overseers.	Date of com- pletion.
	1	6	\$181.14	\$181.15	\$262.29	Lanigan .....	Mar. 21, 1902
	2	9	185.79	185.78	271.57	do .....	June 27, 1902
		2	125.57	125.58	251.15	Ward .....	June 21, 1902
	1	4	106.75	106.74	218.49	do .....	Do.
	1	4	263.42	263.42	526.84	Prince .....	Mar. 21, 1902
	2	8	220.42	220.43	440.85	Ward .....	Mar. 26, 1902
	3	7	367.40	367.40	734.80	do .....	Aug. 27, 1901
	2	10	412.41	412.40	824.81	do .....	Aug. 1, 1901
	3	8	405.65	405.66	811.31	do .....	Aug. 26, 1901
	1	2	84.84	84.85	169.69	do .....	Oct. 8, 1901
		19	106.39	106.40	212.79	do .....	May 12, 1901
	1	2	166.54	166.54	333.08	do .....	Oct. 4, 1901
	1	1	81.59	81.60	163.19	do .....	Oct. 5, 1901
	2	14	296.89	296.90	593.79	do .....	June 30, 1901
	1	12	234.17	234.16	468.33	do .....	Sept. 23, 1901
		12	197.51	197.52	395.03	Prince .....	Jan. 23, 1902
	1	2	137.50	137.51	275.01	Ward .....	Mar. 15, 1902
	2	7	233.24	233.24	466.48	Prince .....	June 19, 1902
	2		288.60	288.60	577.20	Ward .....	Oct. 14, 1901
	2	6	254.73	254.73	509.46	do .....	Oct. 12, 1901
		4	89.72	89.72	179.44	do .....	Dec. 3, 1901
	1	5	373.58	373.59	747.17	do .....	Aug. 26, 1901
	1	3	126.87	126.86	253.73	do .....	Aug. 15, 1901
	1	6	118.83	118.84	237.67	Thomas .....	July 12, 1901
	2	11	684.73	684.73	a 1,369.46	Beach .....	Sept. 7, 1901
	2	3	487.91	487.92	975.83	Prince .....	Jan. 8, 1902
					b c 3.07	Lanigan .....	Oct. 1, 1901
	3	4	516.47	516.48	1,032.95	Ward .....	Dec. 31, 1901
	2	4	248.82	248.83	497.65	do .....	June 27, 1902
	1	8	104.80	104.80	209.60	Lanigan .....	June 17, 1902
1					74.32	do .....	Sept. 9, 1901
	1	18	138.13	138.13	276.26	Prince .....	Nov. 8, 1901
	1	3	83.28	83.27	166.55	Ward .....	Mar. 20, 1902
	2	8	490.57	490.57	981.14	Thomas .....	Nov. 5, 1901
	1	5	78.14	78.14	156.28	Lanigan .....	Mar. 15, 1902
1					55.67	do .....	Apr. 23, 1902
	2	18	254.07	254.07	508.14	Prince .....	June 7, 1902
		5	97.95	97.95	195.90	do .....	Sept. 18, 1901

Work performed at request of surface department.

c One catch basin abandoned.

TABLE 3.—Statement of sewers laid under the appropriation for assessment

## ASSESSMENT

No. of order.	Location.	Pipe sewers laid (length in feet).					
		8-inch.	10-inch.	12-inch.	15-inch.	18-inch.	21-inch.
124	Truxtun Circle and North Capitol street, between Florida avenue and Quincy street.	-----	-----	227.1	-----	-----	-----
137	Thirtieth street NW., between Dumbarton avenue and O street.	-----	209	-----	-----	-----	-----
168	Third street NE., between V and W streets.	-----	98.5	-----	-----	-----	-----
104	Vine street, between Baltimore and Ohio Railroad and Maple avenue (Takoma Park).	356	-----	-----	-----	-----	-----
123	Whitney avenue NW., about 300 feet east of Brightwood avenue.	-----	-----	116	-----	-----	-----
167	W street NE., between Third and Fourth streets.	-----	-----	-----	-----	-----	-----
154	Wisconsin avenue NW., between Milwaukee and Newark streets.	-----	425.4	-----	-----	-----	-----
Total .....		2,527.30	7,206.70	9,772.53	816	1,567.30	13

TABLE 4.—

No. of order.	Location.	Pipe sewers laid (length in feet).				Manholes.	Basins.	Branches.
		8-in.	10-in.	12-in.	18-in.			
301	Duncan street NE., between Fourteenth and Fifteenth streets.	-----	-----	-----	-----	-----	-----	-----
300	Eighteenth street NW., between I and K streets.	-----	-----	-----	-----	1	-----	-----
304	First street NW., between S and Seaton streets.	-----	64	-----	-----	1	-----	5
308	Florida avenue NE., between Fourteenth and Fifteenth streets.	-----	-----	-----	-----	-----	-----	-----
303	North Capitol and M streets NW.	-----	-----	-----	-----	1	-----	-----
302	Seventeenth street NW., between I and K streets.	-----	-----	-----	-----	1	-----	-----
307	Seventeenth street NW., between G and Pennsylvania avenue.	-----	-----	9	3	-----	1	-----
305	Twenty-sixth street NW., between E and F streets.	3	-----	-----	6	1	-----	-----
306	Thirteenth and Ingraham streets (intersection).	79	-----	-----	-----	-----	-----	2
Total .....		82	64	9	9	5	1	7

<sup>a</sup> Balance carried forward to 6 permit.

<sup>b</sup> Extra excavation for the construction of sewer.

<sup>c</sup> Connecting drain with main sewer under contract with private parties, deposit made for District of Columbia inspection.

# OPERATIONS OF THE ENGINEER DEPARTMENT, D. C. 131

and permit work and whole cost to applicant for fiscal year 1903—Continued.

SYSTEM—Continued.

basins constructed.	Manholes.	Branches.	Cost to District of Columbia.	Cost to property owners.	Total cost.	Overseers.	Date of completion.
-----	12	5	\$167.12	\$167.11	\$334.23	Ward.....	Oct. 23, 1901
-----	1	8	163.36	163.36	326.72	Prince.....	Dec. 3, 1901
-----	1	4	54.62	54.63	109.25	do.....	May 15, 1902
-----	1	11	199.73	199.73	399.46	do.....	July 17, 1901
" 2	-----	-----	-----	-----	120.96	Lanigan.....	Sept. 19, 1901
-----	-----	-----	63.82	63.82	127.64	Prince.....	May 12, 1902
-----	2	12	377.11	377.12	754.23	Thomas.....	Jan. 23, 1902
12	91	477	15,608.11	15,608.33	32,280.39		

<sup>a</sup> Work performed at request of surface department.

Whole cost.

Amount of deposit.	Total cost.	Amount returned.	For whom done.	Overseer.	Date of completion.
\$304.00	\$242.90	(a)	H. N. Taplin.....	Thomas.....	<sup>b</sup> July 31, 1901
40.00	38.85	\$1.15	S. S. Shedd & Bro.....	Condon.....	July 17, 1901
180.00	105.60	74.40	Bailey & Aiken.....	Lanigan.....	Apr. 2, 1901
" 24.00	24.00	-----	M. F. Talty.....	Lamb.....	June 14, 1902
38.00	36.04	1.96	J. R. Quinter.....	Lanigan.....	Dec. 18, 1901
35.00	34.89	.11	D. S. Williamson.....	Thomas.....	Dec. 5, 1901
215.00	116.03	(d)	W. W. Keblinger, agent.....	Lanigan.....	(e)
45.00	44.12	.88	S. S. Shedd & Bro.....	Prince.....	Apr. 3, 1902
90.00	50.25	39.75	Mrs. Carrie Madison.....	Ward.....	May 15, 1902
971.00	701.68	109.25			

<sup>d</sup> Balance of deposit carried forward to fiscal year 1903.

<sup>e</sup> Work completed in fiscal year 1903.

TABLE 5.—Main

No. of order,	Location.	Pipe sewers laid (length in feet.)			
		6-inch.	8-inch.	10-inch.	12-inch.
508	Canal street property yard				
500	Adams Mill road, between Lanier and Kansas avenues				42
530	B street NW., between Sixth and Seventh streets.			6	12
520	Canal street SE., between M and N streets (property yard)			83	
524	Canal street SE., between M and N streets				175
550	C street SE., between Twelfth and Thirteenth streets				
504	Cathedral avenue, under Connecticut avenue bridge				
506	Connecticut avenue NW., just north of Florida avenue				
513	Columbia road and Eleventh street NW. (northwest corner)				3
516	Columbia road, just south of California avenue.				
533	Connecticut avenue and R street NW. (northwest corner)				21
553	Block 30, Columbian College lands				3
500	Connecticut avenue, between Rock Creek bridge and Cathedral avenue				20
585	Columbia road and Twentieth street (northeast corner)				6
507	Dover and Thirteenth streets NE. (northwest corner)			24	
512	Dumbarton street NW., between Twenty-ninth and Thirtieth streets				
525	Delaware avenue and G street NE. (northeast and southeast corners)				63
526	Dumbarton street NW., between Twenty-ninth and Thirtieth streets				
530	Detroit and North Capitol streets (northeast and northwest corners)				66
556	D street SE., between Thirteenth and Fourteenth streets			77	
502	D street NW., crossing Twenty-third street			84	
603	Dumbarton street NW., between Thirty-first and Thirty-second streets				80
529	E street NW., between Ninth and Tenth streets				96
534	Erie street, between Champlain and Ontario avenues			42	
540	Eighth and M streets NW. (northwest and southeast corners)				27
563	Eighteenth and Lowell streets NW. (northeast corner)				51
566	Eleventh and Yale streets NW. (northwest and southwest corners)				45
506	Fourteenth street NW., just north of Florida avenue				
522	Fifteenth street NW., between H and I streets			95	
528	Fifteenth street NW., between F street and New York avenue				80
531	First and Randolph streets NW. (northwest corner)				12
538	Square 461, between Sixth and Seventh streets, B and Pennsylvania avenue NW			3	185
544	Fourteenth and T streets NW. (northeast corner)				3
549	Fifteenth and H streets NW. (northeast corner)			18	
554	Fourth and V streets NE. (northeast corner)				18
567	First and Thomas streets NW. (northwest corner)				15
575	Fourteenth and East Capitol streets (northwest corner)				21
578	Square 567, between First and Second, F and G streets NW				19
598	First and G streets NW. (northwest corner)			3	
514	Georgia avenue SE., between Fourteenth and Fifteenth streets				
595	Georgia avenue SE., between Third and Fourth streets, and in square 802			117	130
541	H street NE., between Thirteenth and Fourteenth streets				21

<sup>a</sup>60 corner and 40 side artificial basin tops constructed.

<sup>b</sup>66 linear feet  $\frac{1}{4}$  feet diameter brick sewer reconstructed.

<sup>c</sup>Includes \$5.54, cost of work by plumber.

and pipe sewers.

Pipe sewers laid (length in feet).				Manholes.	Basins.	Branches.	6-inch cast iron pipe.	4-foot diameter.	Gutter inlet.	Ball section.	Cost of materials.	Cost of labor.	Cost of repairs to pavements.	Total cost.
15-inch.	18-inch.	21-inch.	24-inch.											
											\$227.13	\$197.70		<sup>a</sup> \$424.83
					2			666			46.33	56.31		102.64
	112										233.53	<sup>c</sup> 909.56	\$129.54	1,272.63
					1	1					44.00	66.14		110.14
											57.45	39.37		<sup>d</sup> 96.82
											36.50	143.31		179.81
72					2						66.38	107.72		174.10
									19.5		20.71	37.04		57.75
					1						27.52	21.69		49.21
48					1						45.91	90.70	27.10	163.71
					1						33.99	36.22	3.40	73.61
					1						27.88	20.73		48.61
	99				2	6					243.86	642.18		586.04
					1						36.30	32.12		68.42
					1						33.04	37.81		70.85
243				1		3					152.26	308.78	34.36	495.40
					2						52.00	70.38		122.38
			173	1		7					220.56	435.19	23.37	679.12
					2						53.51	84.77	10.71	148.99
						4					24.36	101.21	6.33	131.90
				1							40.61	135.19		175.80
				1		1					51.51	66.49	6.11	124.11
242				3		11					231.83	<sup>e</sup> 491.61	191.31	914.75
					2						45.59	63.84		109.43
					2						41.05	66.59		107.64
					1						33.23	72.22		105.45
					2						59.84	114.16		174.00
									21		21.49	45.52	10.41	77.42
173				2		5					154.57	366.38	27.77	548.72
	131			2		4					163.44	535.90	127.69	827.03
					1						32.98	38.95	11.51	83.44
				3		16					127.40	294.97		422.37
					1						32.43	33.06		(f) 70.46
					1						44.54	49.62	4.97	94.16
					1						31.88	39.13		71.01
						1					33.48	31.38		64.86
					1		2				26.45	29.87	3.39	59.71
						1					27.94	27.58		55.52
	18			1	2						84.78	97.88		182.66
				2		11					136.52	211.76	28.94	377.22
				1							26.49	35.89	7.19	69.57

<sup>d</sup>Shed constructed to be used in making artificial basin tops.

<sup>e</sup>Includes \$3.04, cost of work by plumber.

<sup>f</sup>Awaiting bill for repairs to pavements.

TABLE 5.—Main and pipe

No. of order.	Location.	Pipe sewers laid (length in feet.)			
		6-inch.	8-inch.	10-inch.	12-inch.
605	Half street SE., crossing K street.			18	6
590	I street NW., crossing Sixteenth street, and Sixteenth street, crossing I street.				42
601	Jefferson street east of Monroe street.				6
602	Jefferson and Polk, Jefferson and Fillmore (south-east crossing).				
519	Kramer street NE., between Sixteenth and Seventeenth streets (north side).		3		
523	Kramer street NE., between Sixteenth and Seventeenth streets (south side).			21	
546	K street NW., between Fifteenth and Sixteenth streets.			6	
564	K street NW., between Thirty-fourth and Thirty-fifth streets.				
510	LeDroit avenue NW., between Seaton and Thomas.				
517	LeRoy place, just west of Columbia road.				
565	L street SE., at intersection of Half street (south side).				72
577	L street NW., between Fifteenth street and Vermont avenue.				
552	Meridian and Erie (northwest corner) and Central and Erie (northeast corner).				51
500	New York avenue NW., between Twenty-first and Virginia avenue.				
501	N street NW., between Seventeenth and Eighteenth streets.				28
509	New Jersey avenue between D and E streets SE.				15
527	North Carolina and Pennsylvania avenues SE. (northeast corner).			126	
550	Nineteenth and T streets NW. (northwest corner).				36
581	North Capitol street between Randolph and S streets (east side).				27
591	N street NW., between Seventeenth and Eighteenth streets (north side).				180
535	Square 155, between Seventeenth, Eighteenth, Q, and Corcoran streets.				
536	Square 155, between Seventeenth, Eighteenth, Q, and Corcoran streets.				
569	O street NW., between Sixth and Seventh streets (south side).				
570	do.				
572	Square 183, Sixteenth and Seventeenth, L and M streets NW.				
573	O street NW., crossing Seventh street (south side).				
596	Square 186, between H and I streets and Sixteenth street and Connecticut avenue.				180
511	P street bridge, over Rock Creek, crossing	120			17
606	Pierce and Jefferson streets, Anacostia (southeast corner).				21
584	Quincy street NW., between Eighth and Ninth streets.				63
504	Rhode Island avenue and T street NW. (intersection).				62
515	S street NW., just west of Florida avenue (south side).				
518	School and Park streets NW. (southwest corner).		30		
521	Second and D streets SE. (northeast corner).			114	
547	South Capitol and M streets.				21
548	South Capitol and O streets (northwest and northeast corners).			18	
574	Seventh street NW., between N and O streets.				410
592	Seventh and P streets NW. (southwest corner).				15
503	Sixteenth street NE., near Rosedale street.				17
532	Sixth and Sumner streets NW. (southwest corner).				24
537	Sixteenth and Gale streets (northwest and southeast corners).				42
571	Sixth street NW., between K street and Massachusetts avenue.			15	
579	Sixth street NE., between Orleans place and Morton place.				24
582	Sixteenth and Rosedale streets NE. (northwest corner).				18

<sup>a</sup> Includes \$22.04, cost of work by plumber.<sup>b</sup> Includes \$11.55, cost of work by plumber.

Continued.

Waters laid (length in feet).			Manholes.	Basins.	Branches.	8-inch cast iron pipe.	4-foot diameter.	Gutter inlet.	Ball section.	Cost of materials.	Cost of labor.	Cost of repairs to pavements.	Total cost.
8-inch.	21-inch.	24-inch.											
			1							\$52.61	\$57.02		\$109.63
135			2							128.69	139.50	\$38.18	304.37
				1						28.91	50.91		79.82
				2						56.81	53.19		110.00
				1						26.71	18.67		45.38
				1						31.89	34.30		66.19
150										94.95	280.09	55.19	430.23
				1						20.75	23.13		43.88
				1						26.08	14.78	39.67	80.53
				1						29.89	42.14	10.96	83.01
			2							49.78	89.35		139.13
101	282		2		7					377.51	954.12	442.73	1,774.36
				2						51.07	93.49	2.20	146.76
			1							61.38	118.99		180.37
			1		12					106.16	a 307.98	39.39	453.53
										5.78	22.11		27.89
				1						50.78	119.06	39.68	209.50
				1						39.83	50.47		90.30
				3						81.66	79.85		161.51
				6						73.33	b 399.38	29.88	472.07
296			2		13					219.51	553.12	217.20	989.83
			1		25					151.13	396.65	308.30	851.08
			1		9					275.61	954.07	60.15	1,289.83
217	276		1		8					175.81	502.89	37.10	715.80
					3					128.78	296.59	45.12	440.49
			1							58.14	174.27	14.78	247.19
			1		3					90.05	148.10	110.93	349.08
			1		144					112.88	c 280.90	63.95	457.73
			1							34.79	34.92		69.71
				2						67.77	90.30		158.07
				1						41.57	49.04		90.61
				1						32.09	41.78	4.69	78.56
				1						33.36	39.92		73.28
				1						55.44	135.39	72.30	263.13
63			1		2					98.17	130.42		228.59
				2						38.43	51.74		90.17
			2		22					187.96	d 808.28	62.51	1,053.75
				1						32.23	31.57		63.80
				1						30.06	23.37		53.45
				1						35.92	45.78	5.51	87.21
				2						60.80	66.93		127.73
			1							25.60	42.46	11.23	79.29
				2						42.33	53.96		96.29
			1							23.43	30.28		53.71

ades \$11.25, cost of work by plumber.

d Includes \$10.80, cost of work by plumber.

TABLE 5.—*Main and pipe*

No. of order.	Location.	Pipe sewers laid (length in feet).			
		6-inch.	8-inch.	10-inch.	12-inch.
586	Sixteenth street NW., crossing K street .....				
587	Sixteenth street NW., between I and K streets .....				
588	Sixteenth street NW., between H and I streets .....				182
587	Sixteenth and Rosedale streets NE. (southeast corner) .....				60
	Sixteenth street NW., between K and L streets, and K, between Fifteenth and Sixteenth streets .....				
502	Tenth and Frankfort streets NE. (northeast corner) .....				27
542	Thirteenth and R streets NW. (northwest corner) .....				9
543	Third and Elm streets NW. (northeast corner) .....				33
545	Twenty-third and N streets NW. (southeast corner) .....				21
551	Thirteenth street NW., between Lydecker avenue and Lamar place .....				30
555	Tennessee avenue and Fifteenth street NE. (intersection) .....			12	
557	Twenty-fourth and S streets NW. (southeast, northeast, and northwest corners) .....				30
561	Twenty-second and Decatur streets (northwest and northeast corners) .....				12
558	Third and E streets SW. (southwest corner) .....				15
588	Twenty-fourth and Bancroft streets NW .....				60
589	Block No. 2, Trinidad .....				
	Thirteenth street and Pennsylvania avenue SE. (southwest corner) .....			99	
604	Square 1008, Twelfth and Thirteenth and H and Wylie streets NE .....	261		21	408
583	Vermont avenue, between L street and Thomas circle .....				
576	Water street NW., between Twenty-fifth and Twenty-sixth streets .....				
599	Washington street, just east of Monroe (Anacostia) (south side) .....				6
600	Washington street, just east of Monroe (Anacostia) (north side) .....				9

—Continued.

sewers laid (length in feet).			Manholes.	Basins.	Branches.	6-inch cast iron pipe.	4-foot diameter.	Gutter inlet.	Ball section.	Cost of materials.	Cost of labor.	Cost of repairs to pavements.	Total cost.
18-inch.	21-inch.	24-inch.											
6		45	1							\$79.42	\$93.36	\$40.50	\$213.28
	339		1		9					347.83	<sup>a</sup> 521.55	38.92	908.50
			1							91.35	159.37	29.90	280.62
				1						35.80	42.57		78.37
									8	33.53	182.74		<sup>b</sup> 216.27
				1						35.95	26.73		72.68
			1	1						48.65	49.42		98.07
				1						39.24	51.58		90.82
				1						33.99	30.37		64.36
				1						37.72	33.76		71.48
				1						21.63	20.62		42.25
				3						79.42	111.16		190.58
				2						37.76	72.87		110.63
				1						22.08	29.21		51.29
				2						51.38	99.35		150.73
		54	1							59.70	73.88		133.58
				1						41.25	69.33		110.58
					35					162.23	799.39		<sup>c</sup> 961.62
					7					82.16	570.31	40.92	693.39
		239	1		1					283.40	465.50		748.90
				1						18.40	23.42		41.82
				1						19.12	24.76		43.88

udes \$33.84, cost of work by plumber.  
 iption of sewer, charged to appropriation for main and pipe sewers 1901, cost of same  
 educted from amounts due Adam McCandlish on contract 2341.  
 rk completed in fiscal year 1903.

TABLE 6.—*Cont.*

No. of order.	Location.	Pipe sewers laid (length in feet).		
		8-inch.	10-inch.	12-inch.
814	Binney street NW., from Fourteenth street westward.....			
817	Brightwood avenue, between Princeton and Bismarck streets.....			
818	Brightwood avenue NW., between Scott avenue and Rock Creek Church road.....			
822	Columbia street NW., between Sherman avenue and Eleventh street.....			
810	Columbia street NW., from Fourteenth street westward.....			
813	Block 38, Columbian College lands.....			
825	Connecticut avenue NW., between Le Roy place and California avenue.....			
829	California avenue and Phelps place (intersection).....		72	
831	Connecticut avenue, between California and Wyoming avenues.....			
811	Decatur place NW., between Florida avenue and Twenty-second street.....			
812	do.....			
835	Decatur place NW., between Twenty-second and Twenty-third streets.....			
816	Eighteenth street NW., between Grant and Lowell streets.....			
817	Eleventh and Clifton streets (intersection).....			8
822	Eighth street NW., between Trenton and Utica streets.....		142	
823	Eighteenth and Lowell streets (intersection).....			8
830	First street NW., crossing Albany street.....			17
815	Grant street, Anacostia, from Nichols avenue eastward.....			
806	Harvard street NW., between Eleventh and Thirteenth streets.....			
821	Harwood avenue NW., near north side Maple avenue.....			
820	Highland avenue NW., west of Connecticut avenue.....	67		
823	Ingraham street, between Brightwood avenue and Thirteenth street.....		154	
803	Kramer street NE., between Sixteenth and Seventeenth streets.....			
801	Le Droit avenue, between Seaton and Thomas streets NW.....			
804	Lansing street, crossing Thirteenth street (Brookland).....		33	3
818	Lincoln avenue, crossing at Randolph street.....			
802	Lincoln avenue NE., from T street northward.....			
810	Maple avenue, between Baltimore and Ohio R. R. and Carroll avenue.....		39	
822	Ontario avenue, from Erie street southward.....			
827	Q street NW., between Truxton circle and Florida avenue.....			21
825	School street NW., between Grant and Park streets.....		105	
812	Seventh street NW., between Vermillion and Umatilla streets.....	239		
825	Third street NE., between V and W streets.....	83		
825	Thirteenth and Ingraham streets NW.....		54	
824	W street NE., between Third and Fourth streets.....			12
825	W street NE., between Third and Fourth streets (south side).....			12
Total.....		339	305	61

# OPERATIONS OF THE ENGINEER DEPARTMENT, D. C. 139

sewers, 1902.

sewers laid (length in feet).			Man-holes.	Branches.	Cost of materials.	Cost of labor.	Cost of repairs to pavements.	Total cost.
18-inch.	21-inch.	24-inch.						
376			2	6	\$22.89	\$254.51	\$18.50	\$305.90
				5	273.68	713.99	54.10	1,041.75
146				1	101.76	188.87	<sup>a</sup> 16.57	307.20
69	81		3		211.21	300.95		572.16
	163			2	205.35	584.97		790.32
177		30			116.95	<sup>b</sup> 302.61		419.56
313			2	2	252.82	598.18		851.00
			1		43.66	76.98	<sup>a</sup> 10.96	131.60
				6	181.13	<sup>c</sup> 551.63		732.76
		33	1		57.05	69.15		126.20
	465		3		463.18	663.21		1,126.39
			1		210.67	397.85		548.52
			1		192.38	523.99		721.37
			1		23.96	64.19		88.15
			2		47.14	94.85		141.99
			1		44.48	70.51		114.99
			1		47.78	53.93		104.71
			1		58.37	94.46	5.04	157.87
24			1		39.01	104.42		143.43
39			1		49.12	63.44		112.56
			1	2	35.72	63.64		99.36
			1	2	74.15	103.48		180.63
195	9		2		170.80	389.18		559.98
			1		20.24	27.23	12.47	499.94
			1		43.50	75.06		118.56
			1		59.63	56.68		96.31
9		361	2	3	496.87	564.37		1,061.24
			1		34.86	44.84		479.70
159			1		119.10	167.53		286.63
			1		49.88	87.75	8.86	148.49
			1	3	47.73	94.01		141.74
			1	4	68.67	104.24		232.91
			1	1	23.62	56.38		80.00
			1		35.15	49.47		84.62
			1	1	66.76	95.65		163.41
			1		74.60	87.69		162.29
1,507	718	444	39	38	4,118.72	7,861.89	126.50	12,107.11

<sup>a</sup>Repairs to pavements made in fiscal year 1903.

<sup>b</sup>Includes \$20.00 cost of work by plumber.

<sup>c</sup>Includes \$30.00 cost of work by plumber.

<sup>d</sup>Work begun in fiscal year 1901.

TABLE 7.—Miscellaneous appropriations in

No. of order.	Location.	Pipe sewers laid (length in feet).					
		6-inch.	8-inch.	10-inch.	12-inch.	14-inch.	24-inch.
	Arizona avenue and Joliet street (intersection).....						
1043	Arizona avenue NW., near Tunlaw road.....						
1000	Bladensburg road, between H and Levis streets.....					30	3
1036	Bunker Hill road, between Fourth and Seventh streets.....						
	Canal street SE., between M and N streets.....						
1038	California avenue NW., from Connecticut avenue westward.....				414		
1017	College street NW., about 300 feet east of Fourth street.....						
I. T. C. & N. J. A.	E street SE., just east of Canal street.....				15		
1015	Eleventh street NW., between L street and Massachusetts avenue.....						
1030	Sixth and L streets SE. (northwest corner).....				3		
1033	Second street and Massachusetts avenue NE.....		6				
1027	East side interceptor, between Twelfth and M streets and pumping station.....						
1034	do.....						
1033	E street SE., between Tenth and Eleventh streets.....				3		
1001	Fifth and F streets NE. (southwest and southeast corners).....				3	3	
1023	Fifteenth street NE., between E and H streets.....			12	36		
1007	G street NE., between Second and Third streets.....	18			45		
1009	Fifteenth and F streets NE. (southwest corner).....						
1014	G street, just west of Thirteenth street NE.....				33		
1024	H street and Delaware avenue NE. (southeast corner).....				18		
1028	Harrison and Monroe streets (Anacostia).....						
1029	Kirby street and New York avenue NW. (northwest corner).....						
1022	L street NW., between New Hampshire avenue and Twenty-third street.....				15		
1018	M street NW., between Eighth and Ninth streets.....				33		
1013	O street, south side, just west of Ninth street NW.....			45			
1008	P street and New Jersey avenue NW. (southwest and northwest corners).....				24		
1005	South Carolina avenue and Eleventh street SE. (northeast corner).....				6		
1042	Second street SW., between C street and Virginia avenue.....				51		
1010	Sixth and I streets NE. (southwest corner).....				9		
1011	Sixth and H streets NE. (northwest corner).....				3		
1012	Thirteenth and G streets NE. (southeast corner).....				3		
1031	Fourth and Elm streets NW. (southeast and southwest corners).....				3		
1030	Fifteenth street SE. south of K street.....						
1026	Twelfth and M streets SE.....						
1041	G street just east of Twenty-third street NW.....				21		
1019	North Capitol and O streets (northwest corner).....						
1040	Seventeenth street NW., between T street and Florida avenue.....				21		
1006	Lansing street NE., between Twelfth and Thirteenth streets.....	257					
1037	Maryland avenue SW., between Third and Four-and-a-half streets.....		39		75		
1020	Nineteenth street NW., between R street and Florida avenue.....				6	3	
1035	New Jersey avenue SE. (at foot of).....						
	Second and N streets SE.....						
	do.....						

<sup>a</sup>Constructing bulkhead across mouth of sewer.

<sup>b</sup>Work begun in fiscal year 1901.

<sup>c</sup>Constructing temporary office building.

<sup>d</sup>Includes \$18.55, cost of work by plumber.

<sup>e</sup>Special manhole constructed.

<sup>f</sup>Cost of this work charged to amounts due J. K. Murphy on contract No. 2446.

<sup>g</sup>Watching excavation, cost to be charged to account of Jno. Jacoby.

<sup>h</sup>Completing sewer, cost to be charged to account of Jno. Jacoby.

<sup>i</sup>Removing construction materials and derrick from Water street, cost to be charged to account of Jno. Jacoby.

02; work performed by day labor.

constructed. Basins ad- justed. Basins con- structed.	Cost of mate- rials.	Cost of labor and contin- gencies.	Cost of repairs to pave- ments.	Total cost.	Appropriations.
	\$76.37	\$55.50		\$131.87	Arizona avenue sewer, 1902.
	3.40	50.81		<sup>a</sup> 54.21	Do.
4	100.76	140.46		<sup>b</sup> 241.22	Bladensburg road, 1901.
	15.17	20.71		35.88	Grading and macadamizing Bunker Hill road.
	633.87	467.43		<sup>c</sup> 1,101.30	Sewage-disposal pumping sta- tion, 1902.
1	130.98	<sup>d</sup> 530.69		661.07	Grading Connecticut avenue.
<sup>e</sup> 1	49.06	130.44		180.40	Extension high-service system, 1902.
1	16.44	36.36		<sup>f</sup> 52.80	Tiber Creek and New Jersey avenue high-level interceptor.
1	8.48	4.13		12.61	Sidewalks and curbs around public reservations.
1	25.05	37.47		62.52	Do.
1	25.76	34.30		60.06	Sidewalks and curbs.
	1.43	91.50		<sup>g</sup> 92.93	East side interceptor to New Jersey avenue.
	60.36	754.15		<sup>h</sup> 814.51	Do.
1	22.31	33.98		56.29	Improvements and repairs, southeast section.
2	35.83	55.75		91.58	Improvements and repairs, northeast section.
7	104.54	187.23		292.07	Do.
5	92.66	158.74		251.40	Do.
1	17.75	37.10		54.85	Repairs to streets, 1902.
1	37.38	65.03		102.41	Do.
1	33.56	43.94		77.50	Do.
	2.66	6.67		9.33	Do.
	2.79	6.00		8.79	Do.
3	56.69	82.08		138.77	Do.
2	54.80	64.95		119.75	Do.
1	39.34	49.08		89.32	Do.
2	42.20	52.97		95.17	Do.
1	19.37	36.47		55.84	Do.
4	84.14	149.97		234.11	Do.
1	21.04	32.69		53.73	Do.
1	19.24	33.31		52.55	Do.
1	19.38	31.63		51.01	Do.
2	29.25	60.65		89.90	Paving Elm street between Third and Fourth streets.
		13.13		<sup>i</sup> 13.13	East side interceptor to Twelfth street.
	213.92	1,074.74		<sup>j</sup> 1,288.66	Do.
1	33.55	36.20		69.75	Improvements and repairs, northwest section.
1	27.77	28.04	<sup>k</sup> 23.64	79.45	Do.
6	90.25	192.18		282.43	Do.
	48.16	166.78		214.94	House, lot, and furniture for engine house, Brookland.
5	99.98	177.05		277.03	Improvements and repairs, southwest section.
3	76.94	87.26		164.20	Repairs to streets, avenues, and alleys, 1902.
	5.19	705.37		<sup>l</sup> 710.56	Sewage pumping plant, 1901.
	807.24	<sup>m</sup> 894.08		<sup>n</sup> 1,701.32	Do.
	484.52	<sup>o</sup> 660.13		<sup>p</sup> 1,144.65	Do.

airing sewer, cost charged to account of Jno. Jacoby.

structing drain around engine house.

digging space in front of discharge conduit.

cludes \$4.76, cost of work by plumber.

structing building for temporary sewage pumping plant.

cludes \$31.15, cost of work by plumber.

structing foundation for pumps and engines at sewage pumping plant.

## 142 OPERATIONS OF THE ENGINEER DEPARTMENT, D. C.

TABLE 7.—*Miscellaneous appropriations in fiscal year*

No. of order.	Location.	Pipe sewers laid (length in feet).					
		6-inch.	8-inch.	10-inch.	12-inch.	15-inch.	24-inch.
1021	Prospect street NE. from Lincoln avenue eastward.....		142				
1016	Sixteenth and Gales streets NE. (northeast and south-west corners).				42		
1002	Third street NW., between K and L streets.....	<sup>a</sup> 350					
1032	Thirty-second street NW., between Q and U streets.....				36		
1004	Whitney avenue, between Sherman and Brightwood avenues.	<sup>b</sup> 377					
	Lands of Davidge and Trinity College.....						
1 siphon.	Chestnut and Magnolia avenues, Takoma Park.....	3					
2 siphons.	Various.....	3	60				
	Total.....	1,008	247	57	918	36	3

<sup>a</sup> Constructing subdrain around Banneker school building.<sup>b</sup> Constructing drain.

OPERATIONS OF THE ENGINEER DEPARTMENT, D. C. 143

1902; work performed by day labor—Continued.

4-inch lead connection.	Branches.	Manholes adjusted.	Manholes constructed.	Basins adjusted.	Basins constructed.	Cost of materials.	Cost of labor and contingencies.	Cost of repairs to pavements.	Total cost.	Appropriations.
	2		1			\$50.37	\$143.39		\$193.76	Twelve-room building, second division, Eckington.
					2	44.70	84.81		129.51	Paving Gales street.
	1					77.81	195.83	\$83.90	\$36.94	Repairs and improvements to school buildings and grounds.
				4	2	67.72	90.57		158.29	Paving Thirty-second street.
	1					105.45	233.18	63.63	402.26	Site and erection station house north of Florida avenue.
						1.33	139.49		140.82	Main through lands of Davidge and Trinity College.
15			1		1	53.89	67.81		121.70	Automatic flushing tanks, 1902.
75					4	270.68	399.95		670.63	Do.
90	11	7	3	11	02	4,442.13	8,933.08	150.57	13,525.78	

\* Watching sewer trench, cost charged to account of Jno. Jacoby.

TABLE 8.—Average cost of materials and labor per linear foot of pipe sewers constructed by day labor, also average cost of basins.

[In this table it is assumed that the cost of materials used in basin connections is the same as that in the same size sewer; it is also assumed that on account of the difference in depth of excavation the cost of labor is half the cost of that of the same size sewer. This table does not embrace the cost of work of exceptionally difficult construction.]

Size of sewers.	Length.	Cost of materials.	Cost of labor.	Total cost.
	<i>Feet.</i>	<i>Per foot.</i>	<i>Per foot.</i>	<i>Per foot.</i>
8-inch.....	5,900	\$0.823—	\$0.83—	\$1.653
10-inch.....	9,285	.413+	.973—	1.386
12-inch.....	15,550	.465—	1.035—	1.500
15-inch.....	3,873	.621+	1.46+	2.081
18-inch.....	3,327	.778—	1.736+	2.514
21-inch.....	1,907	.958—	1.91—	2.868
24-inch.....	901	1.231+	2.427+	3.658
8-inch connection.....	75	.323	.415	.738
10-inch connection.....	647	.413	.487	.900
12-inch connection.....	1,899	.465	.517	.982
15-inch connection.....	201	.621	.73	1.351
18-inch connection.....	222	.778	.868	1.646
24-inch connection.....	3	1.231	1.213	2.444
Basins constructed.....	158	18.732	27.132	45.864

TABLE 9.—Number of foremen, inspectors, and other employees of the sewer division, office of the chief clerk engineer department, disbursing officer, inspector of asphalt and cements, and of the engineer stables, temporarily employed, and appropriations from which paid, for fiscal year ending June 30, 1902.

Class.	Number employed.	Cleaning and repairing sewers and basins.	Replacing obstructed sewers.	Main and pipe sewers.	Suburban sewers.	Assessment, permit, and whole cost to applicant.
Foremen.....	12	\$9,556.02	—	\$1,424.75	\$596.50	\$1,204.00
Inspectors.....	15	212.00	\$302.00	886.25	1,878.00	708.00
Other employees.....	406	31,302.05	—	16,147.61	8,383.71	29,112.54
Total.....	433	38,160.07	302.00	18,458.61	10,858.21	31,024.54

Class.	Preparation, plans, and specifications, sewage-disposal system.	Arizona avenue sewer.	Automatic flushing tanks.	East side intercepting Twelfth street SE. and pumping station.	East side intercepting Twenty-second and A streets NE. and Twelfth street SE.	Tiber Creek and New Jersey avenue high-level intercepting sewer.
Foremen.....	—	\$8.50	\$42.00	\$12.00	\$223.00	\$5.00
Inspectors.....	—	1,933.50	—	1,096.00	662.00	—
Other employees.....	\$6,351.65	1,087.71	426.75	836.12	2,284.86	31.36
Total.....	6,351.65	3,029.71	468.75	1,944.12	3,169.86	36.36

Class.	L street sewer.	Sewage pumping plant.	Extension of boundary sewer.	Low-area trunk sewer.	Main through grounds of Davidson and Trinity College.	Emergency fund.
Foremen.....	—	\$200.75	—	—	—	\$49.25
Inspectors.....	\$170.00	2,265.50	\$643.50	\$848.00	\$616.00	—
Other employees.....	—	3,359.67	1,027.40	737.87	607.41	243.19
Total.....	170.00	7,625.92	1,670.90	1,585.87	1,223.41	292.44

TABLE 9.—Number of foremen, inspectors, and other employees of the sewer division, office of the chief clerk engineer department, etc.—Continued.

Class.	Bladensburg road.	Grading and macadamizing Bunker Hill road.	Grading Connecticut avenue.	Extension high-service system.	Sidewalks and curbs around public reservations.	Improvements and repairs, SE. section.
Foremen.....	\$7.00	\$3.00	\$35.00	\$11.00	\$6.00	\$4.00
Other employees.....	121.97	16.00	445.66	110.85	51.02	27.30
Total.....	128.97	19.00	480.66	121.85	57.02	31.30

Class.	Improvements and repairs, NE. section.	Improvements and repairs, NW. section.	Sidewalks and curbs.	Repairs to streets.	Paving Elm street between Third and Fourth streets.	House, lot, and furniture for engine house, Brookland.
Foremen.....	\$34.00	\$21.00	\$4.00	\$68.50	\$10.00	\$11.00
Other employees.....	335.57	214.87	27.44	572.43	74.10	145.54
Total.....	369.57	235.87	31.44	640.93	84.10	156.54

Class.	Improvements and repairs, SW.	Repairs to streets, avenues, and alleys.	Twelve-room building, second division, Eckington.	Paving Gales street.	Repairs and improvements to school buildings and grounds.	Paving Third street.	Site and erection station house north of Florida avenue.
Foremen.....	\$15.00	\$8.00	\$7.00	\$7.00	\$18.00	\$9.00	\$24.00
Other employees.....	148.86	77.95	127.16	71.64	164.80	74.03	190.02
Total.....	163.86	85.95	134.16	78.64	182.80	83.03	214.02

WASHINGTON, August 21, 1902.

SIR: I have the honor to submit the following tabulated statement of the amount of conduits laid during the fiscal year ending June 30, 1902.

Very respectfully,

GEO. W. WALLACE,  
Inspector, Sewer Division.

Mr. D. E. McCOMB,  
Superintendent of Sewers, District of Columbia.

TABLE 10.—Amount of conduits laid from July 1, 1901, to June 30, 1902.

No. of duct.	United States Electric Lighting Co.		Potomac Electric Power Co.		District of Columbia.		United States Government.	
	Conduit.	Duct.	Conduit.	Duct.	Conduit.	Duct.	Conduit.	Duct.
	Feet.	Feet.	Feet.	Feet.	Feet.	Feet.	Feet.	Feet.
1.....	97	194			3,191	3,191		
2 <sup>a</sup> .....	5,123	20,492	27	108			1,056	4,224
4.....	466	3,728						
8.....	336	8,064						
24.....	2,049	57,372						
28.....								
Total.....	8,071	89,850	27	108	3,191	3,191	1,056	4,224

<sup>a</sup> Existing 2-way increased to 4-way.

## 146 OPERATIONS OF THE ENGINEER DEPARTMENT, D. C.

## NUMBER OF MANHOLES AND HAND-HOLES BUILT.

	Manholes.	Hand-holes.
United States Electric Lighting Co.....	97	117
Chesapeake and Potomac Telephone Co.....	2	
Potomac Electric Power Co.....	4	16
District of Columbia.....	21	
City and Suburban Railway Co.....	1	
United States Government.....	7	
Western Union Telegraph Co.....	1	
Postal Telegraph and Cable Co.....	2	
Total.....	135	133

## SUMMARY OF CONDUITS IN USE JUNE 30, 1902.

No. of duct.	United States Electric Light- ing Co.		Chesapeake and Potomac Tele- phone Co.		Potomac Electric Power Co.	
	Conduit.	Duct.	Conduit.	Duct.	Conduit.	Duct.
	<i>Feet.</i>	<i>Feet.</i>	<i>Feet.</i>	<i>Feet.</i>	<i>Feet.</i>	<i>Feet.</i>
1.....	26,177	26,177	13,596	15,596	1,557	1,557
2.....	128,223	256,446	4,354	8,708	766	1,532
3.....	236	708				
4.....	78,832	313,328	660	2,640	6,046	24,184
5.....	35,461	212,766	23,185	139,110	9,488	56,928
6.....			82	574		
7.....	11,818	94,544	18,090	144,720	8,634	69,072
8.....			114	1,026	7,288	65,392
9.....	88	880				
10.....	1,491	17,892	4,963	59,556	37,979	453,736
11.....			212	2,756	374	4,988
12.....	1,224	18,136				
13.....	68	1,020				
14.....	2,793	44,688	5,825	93,200	1,314	21,824
15.....			636	10,812		
16.....			1,576	28,368		
17.....			26	520	85	1,700
18.....	2,435	58,440	2,072	49,728		
19.....			304	7,600		
20.....	2,049	57,372				
21.....	53	1,590				
22.....			485	15,520		
23.....	3,854	138,744	26	936		
24.....			1,589	63,560		
25.....					424	18,064
26.....			749	41,944		
27.....					7	496
28.....	106	6,784	176	11,264		
29.....			76	5,472		
30.....						
31.....						
32.....						
33.....						
34.....						
35.....						
36.....						
37.....						
38.....						
39.....						
40.....						
41.....						
42.....						
43.....						
44.....						
45.....						
46.....						
47.....						
48.....						
49.....						
50.....						
51.....						
52.....						
53.....						
54.....						
55.....						
56.....						
57.....						
58.....						
59.....						
60.....						
61.....						
62.....						
63.....						
64.....						
65.....						
66.....						
67.....						
68.....						
69.....						
70.....						
71.....						
72.....						
Total.....	294,408	1,249,515	80,796	703,610	73,962	721,361

No. of duct.	Brightwood Rail- way Co.		District of Co- lumbia.		Private conduits	
	Conduit.	Duct.	Conduit.	Duct.	Conduit.	Duct.
	<i>Feet.</i>	<i>Feet.</i>	<i>Feet.</i>	<i>Feet.</i>	<i>Feet.</i>	<i>Feet.</i>
1.....			6,568	6,568	30	30
2.....	13	26	80	160	227	454
3.....			44	176		
4.....			711	4,266		
5.....						
6.....	176	1,408				
7.....						
8.....						
Total.....	189	1,434	7,408	11,170	257	494

# OPERATIONS OF THE ENGINEER DEPARTMENT, D. C. 147

## SUMMARY OF CONDUITS IN USE JUNE 30, 1902—Continued.

No. of duct.	Postal Tele- graph and Ca- ble Co.		United States Government.		Anacostia and Potomac R. R. Co.		Capital Traction Co.	
	Con- duit.	Duct.	Con- duit.	Duct.	Con- duit.	Duct.	Con- duit.	Duct.
	<i>Feet.</i>	<i>Feet.</i>	<i>Feet.</i>	<i>Feet.</i>	<i>Feet.</i>	<i>Feet.</i>	<i>Feet.</i>	<i>Feet.</i>
	13,236	13,236						
	1,427	5,708	1,251	5,004	176	704	15,742	31,484
							8,720	34,880
							7,320	43,920
							29	243
					159	1,272	2,761	22,088
					245	2,450		59,608
							4,257	200,388
							9,102	7,280
							280	
total	14,663	18,944	1,251	5,004	580	4,426	48,218	309,851

No. of duct.	Metropolitan R. R. Co.		City and Suburban R. R. Co.		Total.	
	Conduit.	Duct.	Conduit.	Duct.	Conduit.	Duct.
	<i>Feet.</i>	<i>Feet.</i>	<i>Feet.</i>	<i>Feet.</i>	<i>Feet.</i>	<i>Feet.</i>
					63,164	63,164
					149,405	298,810
					238	708
	21,661	86,044	11,040	44,160	129,357	517,428
			5,117	80,702	81,282	487,662
					111	777
			13,248	105,984	54,886	439,088
					7,402	66,618
			8,060	80,300	8,968	88,630
	11,361	136,572	77	924	55,991	670,682
					536	7,718
			1,880	23,320	7,961	104,054
					68	1,080
					9,982	158,912
					636	10,812
			2,214	89,852	8,790	68,320
					111	2,320
			134	2,948	9,243	203,348
					4,507	108,168
					904	7,600
					280	7,280
			87	2,436	2,136	59,808
					53	1,580
					485	15,520
			196	7,394	8,880	139,680
					198	7,394
					1,539	69,560
					424	18,656
					749	41,944
					7	408
					282	18,048
					76	5,472
total	33,042	223,216	42,020	340,960	596,789	3,679,975

## REPORT OF THE INSPECTOR OF PLUMBING.

WASHINGTON, D. C., August 25, 1902.

I have the honor to submit the twentieth annual report of work performed by plumbing inspection division for the fiscal year ending June 30, 1902: if January 26, 1902, this office was under the direction of Mr. Charles B. as it had been since November 20, 1894. On January 26, Mr. Ball tendered signation to the Board of Commissioners, District of Columbia, in order to an appointment in New York City as chief sanitary inspector of the tenehouse department. Since February 6, having been appointed to fill the made vacant by the resignation of Mr. Ball, the responsibilities of the office leveloped upon myself.

## INSPECTIONS AND RECORDS.

The total number of inspections under the direction of this office was 22,621, an increase of 929 over those of the previous year. These comprise 3,868 examinations of existing plumbing; 7,126 inspections of remodeling, extensions, and repairs; 6,017 inspections of plumbing in new buildings; 1,996 peppermint tests; 1,283 inspections of gas fitting and gas fixtures; 658 inspections of lead water-service pipes; 754 sewer laterals tapped into main sewers; 55 new terra cotta house sewers, and 760 repairs to terra cotta sewers.

The number of notices personally served upon property owners and derelict registered plumbers was 104. The number of letters written and orders and indorsements made amount to 1,721, the detail of which includes miscellaneous letters, 279; letters to master plumbers, 248; orders to repair plumbing and gas fitting, 430; indorsements on communications forwarded, 639; letters to the Engineer Commissioner and other District officials, 125, and specifications for plumbing work in District buildings and houses into which sewer and water have been introduced by order of the health officer, 19.

Plumbing plans were examined and approved and certificates issued for 1,008 new buildings, an increase over last year of 37.

## PLUMBING IN PUBLIC SCHOOLS.

The appropriation of \$25,000 for repairs to and changes in plumbing in public schools resulted in the preparation of plans and specifications and the renovation of the plumbing in the Lincoln, Mott, and Randall school buildings and the erection of a single structure containing a boiler room and toilet facilities for the Addison and Curtis schools. The work in the first three schools mentioned consisted in detached single-story toilet buildings fully equipped with approved types of fixtures and provided in each case with an independent steam heating apparatus.

The plumbing work proposed for the fiscal year ending June 30, 1903, includes new toilet facilities for the Morse, Maury, Amidon, Wormley, Twining, and Blair schools, the fixtures to be located in each case in the basement with necessary small fixtures for the upper floors. All the schools mentioned have very antiquated plumbing arrangements located in inferior outside buildings, with no possible means of protection from frost.

## DRAINAGE OF LOTS.

In connection with the expenditures from the emergency fund for the enforcement of the provisions of section 4 of an act to provide for the drainage of lots in the District of Columbia, approved May 19, 1896, I would respectfully state that during the fiscal year ending June 30, 1901, plans and specifications were prepared and bids received in five separate cases, embracing 10 premises, for the introduction of water and sewer connections. These were the first cases of compulsory drainage undertaken by the District in accordance with the act noted above.

In connection with the expenditures from the same appropriation for the fiscal year ending June 30, 1902, I would respectfully state that plans and specifications were prepared and bids received in 8 separate cases, embracing 19 premises, for the introduction of sewer and water accommodations. The expenditures in these cases nearly exhausted the full amount of the appropriation available for this work.

## PROSECUTIONS.

Thirty-eight cases involving violations of the plumbing and gas-fitting laws and regulations were brought to the attention of the police court. Nineteen were for violation of the plumbing and gas-fitting laws, 3 for employing unregistered plumbers and gas fitters, 1 for excavating in the public space without a permit, and 15 for violation of the plumbing regulations. In 18 of these cases fines were imposed, 11 were not-prossed for reason that the orders of the Commissioners to comply with the plumbing regulations had been complied with after information had been filed in the police court and 2 for want of evidence, 6 forfeited collaterals, and 1 case was dismissed.

## PUBLIC TOILET STATIONS.

The question of providing public toilet stations for the city, to be used by both men and women, is one of considerable importance, and efforts should be made to secure permission from Congress to make use of such Government reservations as may be found necessary for that purpose.

As soon as the required permission has been granted for the location of such constructions, no time should be lost in securing an appropriation for the preparation of necessary plans and the construction of at least two such stations. The structures, in my opinion, should be of the underground type, hidden from view, and provision made for care takers to be in attendance at all times. Small fees should be charged for the use of the closets and also for the use of towels and soap in the lavatories, but no fees should be charged for the use of the urinals. By such an arrangement the toilet rooms would be maintained in a high condition of neatness, and from the fees collected it is believed they could be made nearly or quite self-sustaining.

EMPLOYEES PAID FROM GENERAL APPROPRIATIONS.

The services of a draftsman were necessary in this division, and one was employed continuously between July 1 and December 20, 1901, a period of one hundred and forty-four days, at \$4 per diem, \$406 being paid from appropriation for repairs to and changes in plumbing, public schools, 1902, and \$170 from appropriation for repairing and replacing heating apparatus, public schools, 1901 and 1902. A draftsman was also employed continuously between April 14 and June 30, 1902, a period of sixty-seven days, at \$3.50 per diem, \$63 being paid from appropriation for drainage of lots, health department, 1902, and \$171.50 from appropriation for repairs to and changes in plumbing, public schools, 1902.

Very respectfully,

O. L. INGALLS,  
*Inspector of Plumbing.*

Maj. JOHN BIDDLE,  
*Corps of Engineers, U. S. Army.*  
*Engineer Commissioner, District of Columbia.*  
(Through Capt. Chester Harding.)

REPORT OF THE PLUMBING BOARD.

WASHINGTON, August 25, 1902.

SIR: I have the honor to submit the following statement of the work of the plumbing board during the fourth year of its organization:

There were held during the year 23 sessions, most of which were devoted to the examination of candidates for master plumbers' licenses and the discussion of certain sections of the plumbing regulations with a view to determining the advisability of revision of the same.

The following changes in the personnel of the board were ordered by the Commissioners, District of Columbia: Mr. A. M. Lawson, whose term expired on June 30, 1901, was reappointed a member. Mr. T. V. Noonan was appointed a member to take effect on July 1, 1901, vice Mr. Thomas Humphrey, whose term expired on June 30, 1901. Mr. R. A. O'Brien was appointed a member on February 6, 1902, and subsequently elected as secretary of the board, vice Mr. Charles B. Ball, who resigned on January 26, 1902.

The total number of examinations conducted was 31. The number of original candidates examined was 15, of whom 5 passed. The number of those reexamined was 16, of whom 9 passed.

The examinations throughout the year were by the use of written questions and answers.

JOS. R. QUINTER, *President.*  
RICHARD A. O'BRIEN, *Secretary.*

Maj. JOHN BIDDLE,  
*Corps of Engineers, U. S. Army,*  
*Engineer Commissioner, District of Columbia.*  
(Through Capt. Chester Harding.)

REPORT OF THE INSPECTOR OF BUILDINGS.

WASHINGTON, August 12, 1902.

SIR: I have the honor to submit herewith the annual report covering the transactions of the building department for the fiscal year ending June 30, 1902, together with recommendations for the fiscal year ending June 30, 1904.

## 150 OPERATIONS OF THE ENGINEER DEPARTMENT, D. C.

*Statement of permits issued from June 30, 1901, to July 1, 1902.*

	Number.	Value.		Number.	Value.
Brick dwellings .....	734	\$3,365,937	Workshops (brick) .....	6	15,30
Frame dwellings .....	159	290,856	Workshop (frame) .....	1	50
Brick repairs .....	980	1,265,185	Stables (brick) .....	28	59,79
Frame repairs .....	572	87,822	Stables (frame) .....	25	25,15
Apartment houses .....	54	1,232,000	Engines and boilers .....	49	112,56
Stores and dwellings .....	19	89,500	Studio (brick) .....	1	4,90
Stores (brick) .....	16	367,700	Ice house (frame) .....	1	4,00
Stores (frame) .....	3	3,800	Waiting room (frame) .....	1	250
Store and office .....	1	15,000	Blacksmith shops (brick) .....	4	2,312
Office buildings .....	13	461,400	Blacksmith shops (frame) .....	2	475
Churches (brick) .....	8	155,650	Sheds (brick) .....	11	10,69
Church (frame) .....	1	3,000	Sheds (frame) .....	513	23,272
Colleges or schools .....	2	155,000	Gasoline tanks .....	3	20
Assembly halls .....	2	60,000	Greenhouses .....	2	80
Warehouses .....	10	185,550	Minor repairs .....	3,380	30,43
The Rupert Home .....	1	40,000	Awnings .....	133	9,95
Orphan asylum .....	1	10,000	Fire escapes .....	23	9,50
Laundries .....	3	54,900	Elevators .....	56	98,85
Gymnasium .....	1	10,000			
Factory (brick) .....	1	6,000	Total .....	6,821	8,310,260
Factory (frame) .....	1	3,000			

*Comparative statement for years 1901, 1902.*

	New build-ings.	Repairs.	Dwell-ings.	Apart-ments.
1902 .....	1,111	2,063	863	34
1901 .....	1,057	1,896	734	128
Increase .....	54	169	159	+74

a Decrease.

Valuation of building operations:	
1902 .....	\$8,310,260
1901 .....	6,194,060
Increase .....	2,116,100

Number of permits issued, including buildings, repairs and minor repairs, awnings, engines and boilers, etc.:	
1902 .....	5,127
1901 .....	4,586
Increase .....	1,132

Projections approved and not called for .....	30
Projections not approved .....	12
Inspections made, application approved, but not called for .....	116
Inspections made, applications not approved .....	81

The following summary will show the distribution of improvements in the different sections of the District and the value of the same:

	Buildings.	Repairs.
Northwest .....	\$3,498,020	\$833,635
County .....	2,494,626	149,441
Southeast .....	415,862	359,048
Northeast .....	251,498	25,711
Southwest .....	147,400	27,537
Total .....	6,787,406	1,374,364

Receipts of the office for the past year are as follows:

For building permits and repairs .....	\$3,916
For engines and boilers, ovens, gasoline tanks, elevators, electric motors, etc. ....	51
For projections beyond the building line .....	252
For awnings .....	130
For stands .....	8
Total .....	4,357
Received for year 1901 .....	3,137
Increase .....	1,220

An examination of the foregoing summary affords a good example of the rapidly increasing business of this office, showing an increase in valuation of building operations of \$2,116,160 over previous year.

The building operations have increased steadily at the rate of over half a million dollars a year since 1894, when they were at their lowest ebb during the last twenty years, the valuation being at that time \$4,304,941. This steady increase in the volume of business has been transacted by this office with comparatively the same force employed in former times.

By reference to the number of permits issued during the past year it will be seen that an average of 19 permits are issued daily, and this branch of the work is transacted through the principal assistant inspector, who without assistance is required to pass upon the various subjects enumerated in the foregoing summary with such promptness and dispatch that it is impossible to give to each the consideration it deserves.

The builders of the city complain of the time consumed in obtaining permits, but, considering the number issued each day by one man, it will be seen that this delay is unavoidable with the present force. The principal assistant, or permit clerk, now issues one permit every twenty minutes, and when we stop to consider that within this time plans and specifications must be examined to ascertain whether they are in accordance with the regulations, and careful examination made of plats and locations, and comparison of projections beyond the building line with plans approved, and calculations made on strength of materials, it seems evident that this branch of the work of the office should be provided with an increased force, so that it may be handled, as it is in the other large cities, in a more systematic manner. In order to do this at least two assistants should be assigned to the permit desk in addition to the principal assistant; but as these can not be spared from the small force in the field, we are compelled to continue in the present very unsatisfactory manner until additional employees are authorized by Congress.

I submit herewith a report of the assistant inspectors in charge of field work or inspection of buildings in course of construction or repair within the District, and in connection with this report I beg to invite attention to the fact that during the building season the number of buildings under the care or supervision of each inspector amounted to 180 buildings in one month, which forcibly shows the inadequacy of the present force, for at this rate if each inspector made 14 visits a day to the buildings proper, not allowing any time for investigation of the numerous complaints and minor matters assigned them for report, it would be impossible to visit each of the buildings above mentioned more than twice in one month, and I find by reference to the summary at the beginning of my report that permits were issued for 3,176 buildings during the year, or a monthly average for the six inspectors of 50 buildings per month, thereby rendering it impossible on a basis of 12 visits a day to reach each building oftener than once every four and one-half days, not allowing for the greater amount of time consumed in minor matters not strictly in the nature of construction, such as downspouts, signs, awnings, unlawful occupancy of buildings, and investigation of complaints, which undoubtedly consume one-half the time of the inspectors, thereby rendering it impossible to properly inspect the number of buildings referred to oftener than once a week. From the above statement and in view of the territory covered by the District, I am forced to believe that our present corps of inspectors should be nearly doubled.

I beg to invite attention to reference in report of assistants to the present license law relating to contractors and builders, and heartily commend the suggestion that those who are licensed should be subjected to an examination by a competent board, under conditions similar to the plumbing board or the board of steam examiners. It seems hardly reasonable that the law appreciates the necessity of licensing and examining a man who is charged with the installation of plumbing fixtures in a house and the operation of a power plant, while the man who is morally responsible for the safety of the entire structure from foundation to roof, containing the plumbing fixtures and heating apparatus, is not required to furnish evidence of his ability to safely construct the building wherein the lives of hundreds may be jeopardized through his ignorance.

The report of assistant inspector in charge of elevators and fire escapes shows that it is impossible for one man to properly inspect the elevators of the District as often as required by law, if required also to locate all fire escapes and direct the installation of steam boilers and other motive power. The amount of his time encroached upon for assistance in repairing or remodeling the heating and ventilation of District buildings has resulted in a serious decrease in the number of inspections of elevators, but notwithstanding this extra tax on his time, he shows

that his inspections of a miscellaneous character were maintained at the rate of four each day.

I am thankful to report that one additional inspector of elevators assumed his duties on the first of the present fiscal year, which it is hoped will result in more frequent supervision of this responsible part of our work.

Several fatal accidents have resulted in the past year from the operation or management of elevators, not from mechanical defect, and I especially recommend the adoption of the suggestion that operators be examined as to their qualifications. The driver of an automobile is required to pass an examination, but the elevator operator seems to be selected according to the terms made with the owner, and in most of the accidents reported no regular or competent operator was present.

Reference is made to the defects of the present fire-escape law, which has been depended upon for requiring means of saving life in case of fire or panic, and has been applied in as practical a way as possible.

All buildings mentioned in the act and requiring licenses have been inspected annually, and pending the approval of application for license have been in technical compliance with the law, though never, in most cases, effectually provided with proper safety appliances. I would recommend that one assistant, either under this office or the fire department, be continuously employed to make frequent inspections, to require proper maintenance of appliances after they are installed according to law.

A special committee has been appointed by the Commissioners to report on this subject, and my experience leads me to believe that a joint resolution of Congress, repealing the present law and conferring authority on the Commissioners to make regulations governing the application of safety appliances, will be the only precise means of affording greater safety in case of fire.

In the report of the computer special reference is made to the frequency of accident in the use of derricks, scaffolds, and lack of precautions for safety of workmen on buildings. The present regulations are silent on this subject and the accidents of the past year, resulting fatally in several cases, seem to demand our care, but with our present force it would be a self-imposed obligation and responsibility entirely beyond our power to control. It therefore appears urgent to request that an inspector experienced in the use and construction of hoisting machinery and scaffolds be added to the office force.

The number and character of plans examined and passed upon by the computer shows a greater tax on his time than can reasonably be expected. In order to avoid delay in checking work submitted to him he has been required to give much more than legitimate time and has voluntarily devoted hours after office time to public work, besides frequent inspections of work in course of erection. I would therefore recommend one additional computer in order to transact the public business without overtaxing the employees.

One of the most trying and responsible duties imposed on the inspector of buildings is the removal of dangerous buildings or parts thereof. The danger from collapse of old, dilapidated, or damaged buildings seems to have been fully realized when act of Congress, approved March 1, 1899, was approved, and the law has been applied in many cases where the owner of the property can be subjected to service of required notice, but there are many cases now giving this office serious concern where old buildings are on the verge of collapse, but the law is ineffectual as long as the owner can not be served with a notice or arrested.

This law provides, upon the neglect, refusal, or absence of the owner or responsible parties, that the inspector of buildings shall enter upon the premises with such workmen and assistants as may be necessary, and cause the unsafe structure to be shored up, taken down, or secured, etc., and that the cost be assessed against the property and bear interest and be collected as taxes, etc. But the fundamental defect in the execution of the law is that it provides no funds from which to pay "workmen and assistants," and men who live by such work can not afford to wait several years until the amount is collected on assessment and paid to them.

I would therefore recommend that the small revenues of this office, amounting to about \$4,000 yearly, be intrusted to the auditor or otherwise made available as a means of executing the provisions of the law referring to dangerous buildings, and for temporary employment in emergencies of extra assistants necessary to enforce the building regulations in the interest of public safety.

During the past year the building regulations have been revised, promulgated, and distributed to the building trades and others interested. A few amendments have already been made which, however, do not change the intent of the regulations. But it is a continual complaint of builders and architects that frequent

changes made from time to time without previous notice keep them in a state of uncertainty, sometimes embarrassing them in the transaction of business with the owner and requiring incessant application to this office for information not obtainable in the printed copies of the regulations in their possession.

I would therefore most earnestly request that printed copies of changes be sent to this office by the secretary of the Board of Commissioners for distribution, and would most respectfully recommend that certain dates be designated for changes, if possible, such as July 1 and January 1 of each year, and that all changes be advertised and distributed as near these dates as possible.

In order to enforce the provision of section 33, relating to light and ventilation, I most earnestly repeat the recommendation of the late inspector of buildings, made in the last annual report, that a copy of subdivisions hereafter made be furnished the inspector of buildings, as is now done for the records of the assessor's office.

The men in the office have worked earnestly and conscientiously with realization of the responsibilities placed upon them without regard to time, and the clerical force give their services after the usual office hours in order to keep up the current work from day to day, and notwithstanding these efforts the work of the office is slightly behind, with little prospect of completion before the winter months, when the unusual amount of building is comparatively suspended. The clerical services required are of such a nature that I deem it but justice to recommend in the estimates for the fiscal year 1904 that their salaries be more appropriately adjusted, and commend them for your consideration.

The following buildings were completed during the present year:

Matthew G. Emery School, Lincoln avenue and Prospect street, Eckington.

Sayles J. Bowen School, Third and K streets SW.

Washington Heights School, California avenue.

Petworth School.

Benjamin G. Orr School, Twining City.

Kenilworth School.

S. C. Armstrong Manual Training School, P street, between First and Third streets NW.

William McKinley Manual Training School, Seventh street and Rhode Island avenue NW.

School building, North Capitol and P streets NW.

William Syphax School, Half street, between N and O streets SW.

Lovejoy School, Twelfth and D streets NE.

Tenth precinct, Whitney avenue.

Brookland engine house.

Receiving ward, Washington Asylum.

Four-room school building, Industrial Home School.

Stable in rear of No. 8 engine house.

Stable in rear Truck Company F.

New workhouse, rear wing, completed with exception of cells and ceiling. Heating to be installed under separate contract.

#### OTHER BUILDINGS REPORTED.

Plans will be completed in August, 1902, for the following buildings:

Eight-room school building, Twelfth and N streets NE., A. P. Clark, architect.

Eight-room school building, Pierce street, A. B. Mullett & Co., architects.

Eight-room school building, Ninth and D streets NE., Marsh & Peter, architects.

Eight-room school building, Twenty-seventh and K streets NW., Waddy B. Wood, architect.

The following 4-room school buildings were advertised, but proposals exceeded amount available, and revised plans have been completed by the inspector of buildings and specifications now being prepared:

At Good Hope, Brookland, Grant road, now Reno: Enlarging Cranch School, Twelfth and G streets SE., to 8-room building (1902). Special report will be made during the present month on the feasibility of enlarging this building, for the amount appropriated, which was built in 1872. Cost of additional site, \$1,840.80; appropriation, \$27,000.

For reconstructing Manual Training School, Seventh and G street SE., plans were prepared and proposals received which exceeded the amount appropriated, and it is found impracticable to reconstruct this building within the amount named, \$15,000.

For temporary substation in Tenleytown site was recently purchased, leaving a balance of about \$4,000 available for building. Sketches are being prepared for a frame building, to ascertain whether a suitable structure can be erected with this amount.

Engine house, Congress Heights, now under construction; to be completed within eight months.

Municipal almshouse; plans and specifications completed by G. O. Totten, jr., architect. The electrical work now being incorporated in specifications by the electrical engineer, District of Columbia.

For enlargement of girls' cottage, Industrial Home School, proposals were received which exceeded the former appropriation. New plans and specifications will be ready by about August 18, 1902.

During the year the appropriation for the card index for permit records was partially expended and the work completed.

I have the honor to append the reports of the computer, assistant inspectors, and the assistant inspector for elevators and fire escapes.

Very respectfully,

SNOWDEN ASHFORD,  
*Inspector of Buildings.*

Maj. JOHN BIDDLE,  
*Corps of Engineers, U. S. Army,*  
*Engineer Commissioner, District of Columbia.*  
(Through Capt. Chester Harding.)

WASHINGTON, D. C., August 12, 1902.

DEAR SIR: I have the honor to herewith submit my annual report for the fiscal year ending June 30, 1902:

Many serious foundation cases have received consideration, test loads being applied frequently to determine the actual bearing capacity of the soil, that having varied from 1,000 to 12,000 pounds per square foot of bearing surface.

The subject of the compressibility of soils has received most careful consideration, with a view to decide the extending subsurface and indeterminate lines of pressure exerted in soil under a given unit stress imposed on soil, and under varying conditions, such as the foundations of piers, walls, and the returns thereof.

Actual structural material, such as granite, stone, marble, terra cotta, brick, cast iron, wrought iron, structural steel, and wood, I have found in accord with the requirements of the building regulations; in some cases of manufactured material much improvement in quality and workmanship being noticeable.

All structural steel used and obtained directly from the rolling mills in this country has been of a quality fully equal to the standards required by the building regulations, the most careful scrutiny being necessary, however, to prevent the injudicious use of steel imported from abroad and not fully up to the standards required by this department, the means of detection being threefold. First, by comparison with actual standard American sections; second, by weight; third, by microscopical or chemical analysis, the foreign material having a greater per cent of carbon in it than that of American manufacture.

The utmost care has been used to detect the use of structural sections that have come from buildings destroyed by fire, not exceeding 50 per cent of the original value being allowed in any case.

Frequent cases have occurred where attempts have been made to use old iron of approximately similar structural section to the standard steel sections, computed and approved by this department. The material so found has been promptly condemned or its value allowed for as iron less 25 per cent on account of deterioration should such have occurred.

The assembly and shop work on structural steel columns, girders, trusses, etc., has been of a high standard, while the field work in some cases has been quite inferior, necessitating the condemnation of over 3,000 rivets during the year.

The amount of structural steel used has been in excess of any previous year, a total quantity approximating 5,600 tons having been used, the same question being applicable to cast iron, of which 4,000 tons have been used in conjunction with steel and for structural purposes.

This department has records of 31 different "fireproof" floor systems at this time, these being different combinations of steel, iron, brick, terra cotta, and concrete. Highly satisfactory tests as to the carrying capacity of some of these floors have been made, test loads having been applied largely in excess of the requirements of this department without fracture or permanent settlement.

To overcome any possibility of accident during the progress of these tests, special apparatus has been devised to record deflection.

Commendable speed has been made in the erection of our larger and more impor-

tant buildings. This, while not interfering with the stability of these structures, lessens the existence of an ever-present possibility of accident during their erection.

The continual alteration of old buildings for mercantile purposes, such as stores, warehouses, etc., and the possible overloading of floors, girders, walls, columns, and foundations in many cases has necessitated the utmost vigilance.

Much attention has been given to the installation of elevated water tanks for fire extinction and other purposes, these tanks having proved in many instances a continual danger from the liability of the supports to collapse; the most highly favored system being that of support from brick walls.

The question of the judicious handling of explosives and their action on buildings erected for their storage or otherwise has received the most careful and exhaustive study during the year. The more common causes of explosion are found to be from acetylene gas, boilers, cerberite, calcium carbide, coal oil, celluloid, dynamite, gas, gasoline, hot air, nitroglycerin, paraffin, and thermite. The few explosions from which this city has suffered has been from steam and gasoline and not from the lack of proper safeguards, the accidents in each case being from a lack of knowledge on the part of the operator.

The apparatus used for the hoisting of material has not been in all cases up to the high standard that its duty demands. Many fathoms of steel and hemp cable have been examined, portions condemned, and tests applied. In one ground test a hemp mooring cable snapped four times. Had this happened in an elevated position I fear the results could not have been otherwise than fatal.

I have to particularly thank Mr. A. M. Lawson, inspector of elevators, for his able judgment and hearty cooperation on all matters pertaining to cables and rigging connected with hoisting apparatus.

During the last year a system of recording accidents was inaugurated. This department keeping in touch with the larger cities of the Union and abroad, if the first data obtainable is insufficient, the city is immediately communicated with, with a view to obtaining clear, concise, and definite data relating to the case in question; we are thus informed as to the cause of accidents, fires, explosions, etc., elsewhere and can avoid largely similar trouble here.

Twenty-six strain sheets have been made to test structural drawings submitted and 236 sets of drawings, necessitating in cases as many as 25 and 30 sheets of computations have been passed upon and approved by me, while many sets of drawings have been approved without the need of computation during the year, and I regret to say some of the drawings submitted have been so vague, so lacking in detail, so utterly impractical, that I have been compelled to return them to their owners five and six times for revision, and in some instances entire redrawings, resulting in the loss of much time to this department.

Where the conditions are complex, where the element of danger exists, it can not be but utter ignorance of the necessities or culpable negligence that would allow anyone to submit the so-called drawings that no one but themselves can understand.

Thanking you for your courtesy and cooperation, I have the honor to remain, sir,  
Your most obedient servant,

C. W. SOMMERVILLE,  
*Computer, Building Department.*

SNOWDEN ASHFORD, Esq.,  
*Inspector of Buildings, District of Columbia.*

WASHINGTON, D. C., August 12, 1902.

DEAR SIR: We have the honor to submit the following report of our official duties as assistant inspectors of buildings during the fiscal year ending June 30, 1902:

Visits to new buildings.....	23, 142
Visits to old buildings.....	7, 221
Visits of miscellaneous character.....	3, 419
Total, 1902.....	33, 782
Total, 1901.....	22, 035
Increase.....	11, 747
Condemnations of buildings or parts thereof—	
1902.....	1, 247
1901.....	579
Increase.....	668
Number of buildings renumbered.....	74

The addition of two assistants to your staff at the beginning of the fiscal year has enabled each man to devote more time to field work, and has resulted in a large increase in the total number of visits over any previous year.

We feel justified in stating that in consequence of the closer supervision we have been enabled to give to the work in our respective territories that there has been a decided improvement in the manner of construction and repair of buildings throughout the District. This improvement is especially marked in the class of buildings erected for speculative purposes.

The fiscal year just ended has been notable for the number of large buildings constructed, including mercantile, office buildings, and apartment houses, many of them of the most modern style of construction, involving many details not met with in ordinary buildings and requiring special supervision by this department.

Considerable time was devoted to the examination of old and defective buildings, the number condemned as dangerous, or dilapidated beyond repair, being largely in excess of the previous year.

The revised building regulations, which went into effect March 1, 1902, contained several apparently radical changes, the enforcement of which necessarily causes some slight friction and adds to the burden of work and responsibility placed upon your staff. In this connection it is gratifying to note that, as a rule, the most prominent and well-informed architects and builders have shown commendable readiness to adapt themselves to the new conditions and a willingness to conform to the new regulations.

There is another class of persons engaged in the building business as contractors and subcontractors whose lack of technical or practical knowledge of construction leads them to frequent violations of the regulations. In a business which so closely involves the safety of life and limb, as well as the protection of property owners, it is but reasonable to presume that those who are engaged in business as general building contractors should have the knowledge essential for the safe and proper conduct of such business, and subcontractors upon whose branches of the work the stability and safety of the entire superstructure is primarily dependent should be required to exhibit a sufficient knowledge of their business to insure the public against dangerous or faulty construction.

Inasmuch as the present law requires that contractors be licensed, we would respectfully suggest that before such license be granted applicants be required to pass an examination before a competent board to determine their qualifications as builders, and that they be required to register in this office.

We feel assured that the adoption of such a rule would meet with the hearty approval of reputable builders and owners throughout the District, and would be to the betterment of the city in a structural and architectural sense.

During the year we have, in emulation of the example set by our respected chief, endeavored by working early and late to secure such a close compliance with the regulations as would elevate the standard of construction to comport with the dignity of the nation's capital.

During the month of June the total number of building operations requiring inspection by the field force of this office, including new work, repairs, and work of a miscellaneous character, was 1,075, an average of about 180 to each man. When we consider the vast territory over which this work is scattered, it may be readily seen that it is a physical impossibility for the present small force to properly cover the field and to make such frequent and complete inspections as would in every case insure first-class work and a strict compliance with the building regulations.

Thanking you for your uniform kindness and consideration, we have the honor to remain,

Very respectfully,

R. M. EVANS.  
CHAS. A. HARKNESS.  
HENRY STOREY.  
THOS. FRANCIS.  
JOHN P. HEALY.  
EDWARD KERN.

SNOWDEN ASHFORD, Esq.,  
*Inspector of Buildings, District of Columbia.*

WASHINGTON, D. C., July 1, 1902.

DEAR SIR: I have the honor to report the performed duties of the inspector of elevators and fire escapes for the fiscal year ending June 30, 1902, as follows:

New elevators installed	56
Condemnations on elevators during installation	39
Inspections of elevators in operation	697
Condemnations on elevators in operation	88
Fire escapes erected (compulsory)	19
Condemnations on fire escapes during erection	23
Fire escapes erected	23
Steam boilers installed	49
Condemnations under fire-escape law	23
Steam engines installed	19
Gas engines installed	13
Gasoline engines installed	2
Gasoline tanks installed for mechanical purposes	3
Bake ovens erected	3
Buildings examined under fire-escape law	183
Examinations of elevators for the General Government	19
Miscellaneous condemnations	60
Number of official documents written	270
Number of visits made during the year	1,051

I would respectfully invite attention to the inadequacy of the fire-escape law now in force, and would recommend that this law be so amended as to require fire escapes on all buildings three stories or more in height, and not of fireproof construction, used as hotels, factories, manufactories, theaters, tenement houses, seminaries, colleges, academies, hospitals, asylums, halls or places of amusement, or buildings occupied as office buildings.

This law does not give the inspectors of fire escapes authority to order the removal of obstructions from fire escapes after they are in place and the buildings are occupied. There have been many cases where obstructions, such as ice boxes, refrigerators, garbage cans, ash boxes, etc., have been placed on the balconies in such a manner as to entirely block the way to the ladders.

If obstructing fire escapes was made a misdemeanor and punishable by a fine, it would in a great measure tend to facilitate the labors of the inspectors and save many unpleasant visits to the occupants of such buildings.

The act of Congress approved January 26, 1887, and March 2, 1895, requires that buildings occupied for purposes above enumerated, excepting office buildings, must be 50 feet or upward in height before fire escapes can be authoritatively required. Escapes can not now be required on buildings occupied as office buildings, no matter what the construction or height, unless there be a factory or manufactory conducted in some portion thereof.

There have been many buildings recently erected in the District of Columbia, of inflammable material, which have very meager means of exit, and are occupied as apartment houses and hotels, which are within a few inches less than the 50 feet prescribed in the act, and in several cases have a much larger number of occupants than other buildings of greater height and equipped with fire escapes; the former class of buildings in some instances have but one stairway each, constructed of inflammable material, as a means of exit for the persons who may be caught in the upper stories in times of a fire.

This law is also very indefinite as to whether the alarms or gongs shall be operated by hand or electricity, or whether they shall be operated singly or collectively, or whether or not operating stations should be conveniently located so that any occupant may set all the alarms in operation at one time in case of necessity, without having to run a great distance through hallways and down several flights of stairs before a station can be reached.

The notices provided for in the law now in force are not of a uniform character; some proprietors print the notices in very small type, placing them at the bottom of advertising cards and posting them in the sleeping rooms, thus technically complying with the law; while others merely say that "The fire escapes are located at the end of hallways," etc.

I would respectfully suggest the amendment of this law so that the proprietors of establishments where persons are temporarily housed will be required to make plans of each floor, showing the location of all fire escapes and other means of exit, and indicating the course to the same; and also have the hallways placarded with signs showing the direction to the nearest escape; and where escapes are

reached through rooms that may be locked, signs should be placed projecting into the hallways with the words, "To the fire escape," and a figured hand pointing the direction, and axes should be placed on either side of the doorway, if it is not possible to have the door removed from its hinges.

The law governing fire escapes requires "that hallways and stairways shall be properly lighted when occupied at night; and at the head and foot of each flight of stairs and at the intersection of all hallways with main corridors shall be kept during the night a red light;" and the regulation governing "theaters and other places of public assembly," section 176, requires that "red lights over exits in the auditorium and all lights in passages and stairways shall be independent of the lights in other parts of the house and so arranged that they can not be turned off from the stage or platform."

It will be seen by this law and regulation that a conflicting idea is created in the minds of the theater-going public who happen to live in a hotel or apartment house; the exit lights in theaters teaching them that red lights mark all exits, and in time of panic in their homes, are as liable to cause them to rush from a fire escape as to it. In many cases the hallways, corridors, and stairways are so located as not to be in touch with any fire escape or exit, and makes it difficult to understand the red-light mark.

I would recommend that a uniform system of marking exits be adopted for all places of public assembly and in hotels; the marking of exits in apartment houses is of but little assistance, because of the permanent character of the occupancy, and the rules of this office now in force is to touch each suite of rooms with escapes.

The regulations governing the construction, erection, and operation of elevators in the District of Columbia, promulgated March 1, 1902, are such as authorize this office to require a higher standard of efficiency in the construction and erection of elevators, and will insure to the elevator-traveling public a greater factor of safety than heretofore obtained.

For the better protection of property against fire, I have the honor to recommend, in conformity with section 198, building regulations, that no permit for the installation of any elevator, or permission for the alteration of any building for the installation of any elevator, be given by this office, unless the owner or owners of such buildings agree to erect a skylight over the elevator shaft above the roof, with a glass area of at least two-thirds that of the elevator shaft, and the shaft, as far as practicable, be of fire-resisting material; and, where passing through the roof from the ceiling of the last story, all openings to the air space under the roof shall be closed, so that in case of fire the shaft will be utilized as a flue for the relief of the building from smoke; also that an approved wire netting be required to be placed directly under the overhead supporting beams and sheaves, to prevent calamity in the elevator carriage in case of accident to the overhead work.

The regulations providing qualifications of persons operating elevators in the District have heretofore been and now are inoperative because of the lack of facilities for the enforcement of the same. This regulation should be in full force and effect and afford this office the direct control of those who operate elevators as intended by section 205, building regulations. The operators should be accountable to this office for neglect of duty, inefficiency, and for acts which might jeopardize life and limb.

I can not too strongly urge upon you the necessity of making inquiry into the qualifications of those who operate elevators in the District of Columbia. Section 205, of the building regulations, if enforced, would give this office control of the operator and would possibly have been the means of preventing at least one fatal accident during the year. This accident occurred in a class of institutions where all of the employees, official and otherwise, appear to presume that they have the knowledge and authority to operate elevators regardless of the directions of this office.

For a proper enforcement of section 205, it will be necessary for the creation of a board of examiners to inquire into the qualifications of those who follow this vocation.

This board should be given authority similar to other boards that examine into the competency of persons who have control of life and limb while in the discharge of a duty.

Upon proof of efficiency, the operators should be given a certificate to that effect, for which they should be required to pay a fee sufficiently large to bear the expense of conducting the said examinations, as in the case of similar boards acting under the authority of the honorable Commissioners, District of Columbia. This certificate should be revocable by the honorable Commissioners for cause.

Here permit me to say that it is a physical impossibility for your inspectors to make the required examinations while making the regular inspections of elevators, and besides it would hardly seem fair to the operators to have them examined by a one-man system, under the prevailing regulations.

Your attention is invited to the fact that during the fiscal year ending June 30, 1901, the number of inspections of elevators made was 923, while during the past fiscal year ending June 30, 1902, but 697 were made. This is owing to the great amount of time taken with the question of heating and ventilating the municipal buildings erected during the year, and investigating miscellaneous complaints.

Thanking you for the consideration and the support given me in the past, I have the honor to remain,

Very respectfully,

A. M. LAWSON,

*Inspector of Elevators and Fire Escapes, District of Columbia.*

MR. SNOWDEN ASHFORD,

*Inspector of Buildings, District of Columbia.*

### REPORT OF THE SUPERINTENDENT OF REPAIRS.

WASHINGTON, D. C., August 27, 1902.

SIR: I have the honor to submit herewith a report of the operations of the repair department for the fiscal year ending June 30, 1902.

Appropriations amounting to more than \$90,000 were expended for repairs to school buildings, engine houses, police stations, market houses, and police court.

While much of this work, such as steam fitting, kalsomining, etc., necessarily had to be let out by contract, the greater part was accomplished by means of day labor, and during the months of July, August, September, and October over 100 names were carried on the pay rolls. This large force was only necessary during the summer, when the schools were closed and the weather was fair, for a force averaging half this number was sufficient at other times.

The regular employees appointed by the Commissioners were one superintendent at \$5 per diem and one clerk at \$3, whose salaries were apportioned among the several appropriations enumerated hereafter. An additional clerk at \$2.50 per diem was appointed June 16 last to assist in the work during the summer months.

The only employees outside of the office who might be called regular were three foremen, one at \$4 and two at \$3.50 per diem, and one driver at \$2.50 per diem. The other employees were carpenters at \$3 per diem (one carpenter at \$3.20 per diem), painters at \$2.80 per diem, tanners at \$2.80 per diem, bricklayers at \$4.50 per diem, plasterers at \$2.50 per diem, and laborers at \$1.50 per diem, who were engaged in such numbers and at such times as was necessary.

In order to show how the various appropriations were expended, I have set forth, so far as possible, the amounts allowed to each building, and, in a general way, described the character of the work completed.

#### *Repairs and improvements to school buildings and grounds, 1902.*

[Appropriation, \$50,000.]

Name of school.	Amount expended.	Name of school.	Amount expended.
<b>First division:</b>		<b>Second division—Continued.</b>	
Adams .....	\$344.14	Seaton .....	\$835.98
Berret .....	453.30	Twining .....	1,166.53
Dennison .....	264.28	Webster .....	128.19
Force .....	409.35	Total .....	3,782.22
Franklin .....	1,721.43	<b>Third division:</b>	
Harrison .....	186.38	Brent .....	643.36
Hubbard .....	215.87	Carbery .....	312.63
Johnson .....	538.85	Dent .....	22.55
Phelps .....	167.21	Hilton .....	775.44
Thomson .....	261.69	Lenox .....	528.48
Total .....	4,562.50	Maury .....	466.56
<b>Second division:</b>		Peabody .....	1,005.20
Abbott .....	170.45	Towers .....	408.20
Eckington .....	714.05	Wallach .....	470.21
Henry .....	301.47	Total .....	4,682.63
Morse .....	169.43		
Polk .....	296.12		

# 160 OPERATIONS OF THE ENGINEER DEPARTMENT, D. C.

## Repairs and improvements to school buildings and grounds, 1902—Continued.

Name of school.	Amount expended.	Name of school.	Amount expended.
<b>Fourth division:</b>		<b>Eighth division:</b>	
Amidon .....	\$140.19	Buchanan .....	\$354.05
Arthur .....	238.25	Cranch .....	111.76
Bradley .....	149.11	Tyler .....	261.30
Greenleaf .....	581.82	Benning .....	108.96
Jefferson .....	792.93	Congress Height .....	478.80
McCormick .....	152.98	Good Hope .....	109.44
Potomac .....	131.42	Van Buren .....	166.41
Smallwood .....	385.10	Van Buren Anne .....	194.58
<b>Total .....</b>	<b>2,571.80</b>	Benning Road .....	86.09
<b>Fifth division:</b>		Birney .....	607.55
Addison .....	290.75	Burrville .....	51.25
Conduit Road .....	71.00	Garfield .....	298.83
Corcoran .....	644.65	Hillsdale .....	292.96
Curtis .....	258.67	<b>Total .....</b>	<b>3,291.08</b>
Fillmore .....	561.72	<b>Ninth division:</b>	
Grant .....	349.52	Briggs .....	417.38
High Street .....	13.02	Garrison .....	190.25
Jackson .....	132.76	Magruder .....	143.79
Reservoir .....	319.33	Phillips .....	137.25
Threlkeld .....	99.17	Stevens .....	272.67
Toner .....	528.25	Summer .....	168.32
Weightman .....	894.04	Wormley .....	508.06
<b>Total .....</b>	<b>4,162.88</b>	<b>Total .....</b>	<b>1,855.86</b>
<b>Sixth division:</b>		<b>Tenth division:</b>	
Blair .....	546.86	Banneker .....	73.95
Blake .....	535.69	Douglas .....	102.89
Gales .....	738.88	Garnet .....	96.41
Hayes .....	598.46	Cook .....	201.53
Madison .....	298.14	Jones .....	258.65
Pierce .....	278.01	Logan .....	357.11
Taylor .....	682.44	Patterson .....	120.80
Webb .....	52.23	Slater .....	136.72
<b>Total .....</b>	<b>3,730.71</b>	<b>Total .....</b>	<b>1,467.57</b>
<b>Seventh division:</b>		<b>Eleventh division:</b>	
Brightwood .....	\$126.96	Ambush .....	84.31
Brookland .....	255.98	Anthony Bowen .....	104.00
Chevy Chase .....	206.04	Bell .....	227.63
Hamilton .....	179.20	Giddings .....	287.42
Langdon .....	140.62	Lincoln .....	718.15
Monroe .....	179.56	Lovejoy .....	27.32
Takoma .....	69.90	Payne .....	140.80
Tenley .....	358.01	Randall .....	1,367.50
Woodburn .....	179.75	<b>Total .....</b>	<b>3,498.68</b>
Bruce .....	112.57	<b>High schools:</b>	
Bunker Hill Road .....	15.80	Central .....	1,000.00
Grant Road .....	51.75	Eastern .....	1,365.25
Ivy City .....	236.48	Western .....	922.00
Chain Bridge Road .....	20.50	Business .....	80.00
Mott .....	602.08	Colored .....	120.00
Wilson .....	96.77	<b>Total .....</b>	<b>3,488.25</b>
<b>Total .....</b>	<b>2,811.97</b>		

### SUMMARY.

Total accounted for .....	\$40,155.59
Horses and driver .....	768.00
Office salaries .....	1,178.00
Salary of superintendent of janitors .....	1,467.57
Hardware, lumber, etc., in stock .....	4,000.00
Miscellaneous and emergency work .....	2,000.00
<b>Total .....</b>	<b>50,000.00</b>

The requisition blanks which were sent to the various schools in April were filled out, enumerating the necessary repairs, and returned to this office in June. When estimates were made the requisitions showed over \$100,000 worth of repairs asked for, and consequently only the most urgent cases could be attended to.

To give an idea of the character of the repairs made I have enumerated the largest items under the heads of carpentering, painting, and tinning, viz:

*Carpentering.*—Teachers' retiring rooms were built at 6 schools, as follows: Blair, Blake, Brent, Giddings, Twining, and Hilton. New flooring, aggregating

more than 82,000 feet, was put in at 32 buildings, viz: Conduit Road, Brent, Twining, Seaton, Curtis, Fillmore, Force, Gales, Garrison, Henry, Hillsdale, Johnson, Lenox, Lincoln, Madison, Polk, Jefferson, Randall, Thomson, Towers, Wallach, Eastern High, etc. Storm sheds: Ten were erected at 7 schools, viz: Johnson, Johnson Annex, McCormick, Wormley, Dennison, Hayes, and Maury. Book closets—sixty were furnished for the following schools: Dent, Adams, Benning Road, Congress Heights, Douglas, Hamilton, Jefferson, Maury, Towers, Peabody, Van Buren Annex, Taylor, and Payne. Outhouses: Three were built at the Garfield and Orr.

*Painting.*—More painting was done on the schools last year than in any previous year. The entire exteriors of 5 schools were painted and penciled, viz: Twining, Birney Annex, Peabody, Randall, and Tenley. The exterior wood and iron work was painted at Eastern High, Western High, Addison, etc. The interior wood-work of 11 schools was grained or varnished, viz: Twining, Central High, Birney Annex, Ivy City, Blair, Corcoran, Wormley, Weightman, Johnson, Hayes, and Franklin. Iron and wood fences at the Central High and Wormley schools were painted. All of the new carpentering work was primed and painted. Blackboards at almost every school were repaired and reslated where necessary.

*Tinuing.*—A large amount of tin work had to be renewed at a number of schools. New valleys or spouts were put up at the Birney Annex, Briggs, Brookland, Buchanan, Curtis, Cranch, Logan, Madison, Taylor, Van Buren Annex. Old roofs were replaced with new ones at the Franklin, Giddings, Grant, Jefferson, Logan, Madison, Taylor, Weightman, and Benning. The roofs of 27 school buildings were painted.

Of the work let out and completed under contract, the most important was:

*Kalsomining.*—Kalsomining was done at the Franklin, Eckington, Carbery, Maury, Wallach, Greenleaf, Fillmore, Grant, Gales, Colored High, Corcoran, Ivy City, Central High, Wormley, Toner, Sumner, Eastern High, Pierce. Total cost, \$2,661.

*Whitewashing.*—Benning, Benning Road, Burrville, Conduit Road, Fort Slocum, Garfield, Goodhope, Grant Road, Langdon, and Potomac. Total cost, \$129.

*Furnace castings.*—Furnace castings were renewed at the various buildings. Total cost, \$2,399.15.

*Gas engines.*—New gas engines were installed at the Hilton and Eckington schools. Total cost, \$780.

#### NECESSARY REPAIRS TO AND CHANGES IN PLUMBING IN EXISTING SCHOOLS, 1902.

[Appropriation, \$25,000.]

The main part of this appropriation is expended under the supervision of the inspector of plumbing, but this department receives all requests for repairs and immediately orders the same made. During the year about 150 orders were given for repairs which cost more than \$1,000.

#### REPAIRS TO ENGINE HOUSES, 1902.

[Appropriation, \$5,000.]

Engine No. 1 .....	\$75.75	Engine No. 14 .....	\$65.35
Engine No. 2 .....	428.50	Engine No. 15 .....	177.55
Engine No. 4 .....	350.80	Truck A .....	466.88
Engine No. 5 .....	124.25	Truck B .....	195.70
Engine No. 6 .....	136.50	Truck C .....	322.04
Engine No. 7 .....	271.15	Truck D .....	231.13
Engine No. 8 .....	115.33	Truck E .....	52.86
Engine No. 9 .....	195.64	Truck F .....	46.09
Engine No. 10 .....	115.54	Chemical No. 1 .....	222.90
Engine No. 11 .....	164.13	Chemical No. 2 .....	466.56
Engine No. 12 .....	156.00	Chemical No. 3 .....	58.90

#### SUMMARY.

Total accounted for .....	\$4,439.55
Office salaries .....	117.00
Stock—hardware, lumber, etc .....	200.00
Miscellaneous and emergency work .....	243.45
<b>Total .....</b>	<b>5,000.00</b>

The calls for repairs made on this appropriation by far exceeded the amount available. This necessitated the omission of a great deal of important work, and it was with difficulty that a deficiency was avoided. No extraordinary repairs were made, but only the ordinary wear and tear was taken care of, as follows:

*Carpentering.*—New stalls were built or old ones repaired at the following houses: No. 2, No. 5, No. 6, No. 7, No. 8, No. 9, No. 11, Truck A, Truck C, Truck D. New lockers were provided at 4 houses: No. 7, No. 8, Truck B and Truck D.

*Painting.*—The doors and woodwork were painted at many of the houses, as also were the dormitory and engine-room walls.

*Tinning.*—The roofs of a great number of the houses were in a bad condition, and new roofs were found necessary at the following places: No. 2, No. 5, No. 7, Truck C, Chemical No. 1, Chemical No. 3.

#### REPAIRS TO POLICE STATIONS, 1902.

[Appropriation, \$5,000.]

Station No. 1	\$127.23	Station No. 7	\$124.70
Station No. 2	272.67	Station No. 8	417.64
Station No. 3	54.30	Station No. 9	608.87
Station No. 4	719.40	Station No. 10	225.66
Station No. 5	516.25	Substation	69.88
Station No. 6	453.20	Police headquarters	82.70

#### SUMMARY.

Total accounted for	\$4,160.50
Office salaries	117.00
Stock—hardware, lumber, etc	175.00
Miscellaneous and emergency work	547.50
Total	5,000.00

The police stations are all in a good state of repair, the appropriation being about sufficient for the number of houses in service to date. The greatest amount was expended in painting and plumbing during the past year.

Besides the painting of interior and exterior woodwork at the various stations the brick fronts of the following stations were painted and penciled: No. 3 and No. 4.

New plumbing was installed at station houses No. 3, No. 4, No. 5, and No. 9.

#### REPAIRS TO MARKETS, 1902.

[Appropriation, \$2,250.]

Eastern	\$955.28
Western	1,040.14
Georgetown	99.40
Total accounted for	2,094.77
Office salaries	78.00
Emergency work	77.23
Total	2,250.00

The repairs on the Eastern Market were more extensive last year than in any previous year. The interior and exterior of the building were painted, and roof and valleys, which were in a poor condition, were renewed. The Western Market as usual received a large share of the appropriation. Besides the minor repairs which were made at this market a large shed was provided in the rear for the protection of horses and eight large stands were renewed inside.

REPAIRING AND RENEWING HEATING AND VENTILATING APPARATUS, SCHOOLS, 1902.

[Appropriation, \$30,000.]

SUMMARY.

New boilers for eight school buildings.....	\$14,984.45
Two new boiler houses.....	9,380.92
Steam-fitting repairs.....	3,123.00
New boiler tubes, Western High.....	263.00
Office salaries.....	351.00
Miscellaneous and emergency work.....	1,897.63
<b>Total.....</b>	<b>30,000.00</b>

This appropriation was made available on the urgent deficiency bill in order to replace boilers which had been condemned at 8 schools. Contracts were made and new boilers installed at the Peabody, Henry, Central High, Garnet, Lincoln, Curtis, Force, and Jefferson. New boiler houses were provided at the Jefferson and Curtis buildings, but in other cases the new boilers were placed in position of old ones. The item for steam fitting represents the repair work which is found necessary each year to keep the heating apparatus in first-class condition.

REPAIRS TO POLICE COURT, 1902.

[Appropriation, \$800.]

This old building is in a very poor condition, and the appropriation is only about sufficient to meet the heavy wear and tear to which it is subjected.

During the past year the exterior wood and stone work was painted. Much of the interior woodwork was painted or varnished and two walls in each court room were kalsomined. Several of the offices were moved and rearranged, necessitating considerable carpentering work.

Besides the above-mentioned repairs many minor items might be mentioned, such as tinning, plumbing, carpentering, and the installation of electric fans and bells.

MISCELLANEOUS.

In addition to the repairs and improvements made under the above-mentioned appropriations, this department completed a large amount of work on other municipal buildings. Included among these were—

*Alms house.*—One new steam boiler and connections were furnished.

*Smallpox hospital.*—The entire interior and exterior of the buildings were painted. The tin roofs were repaired, renewed, and painted where necessary. New porches were provided and considerable shelving was put up. New granolithic pavements leading to and around the building were laid.

*Industrial Home School.*—New granolithic floors and pavements were laid. Entire exteriors of both buildings were painted. New wood floors were laid in training shop.

*Property yard, District of Columbia.*—One new wagon shed was constructed.

*Disinfecting plant.*—A new concrete floor was laid and a large amount of wood-work was repaired.

*District of Columbia building.*—Alterations were made in the offices of the secretary, fire department, police department, superintendent of property, health department, assessor's office, etc.

*Detention camp, smallpox service.*—New fence was constructed around the premises.

*House of detention, police department.*—New water-closet was provided and the plumbing repaired; eight closets for clothes were constructed; several horse stalls were repaired, etc.

*Reviewing stand, police and firemen's parade.*—A stand was constructed in front of the White House for the police and firemen's parade.

*Western High School.*—The new fence surrounding the school was painted.

Respectfully,

G. B. COLEMAN,  
Superintendent of Repairs.

## REPORT OF THE INSPECTOR OF ASPHALT AND CEMENTS.

WASHINGTON, September 30, 1902.

MAJOR: I have the honor to submit the report of the work done in this office during the fiscal year ending June 30, 1902.

The work of testing may be summarized as follows:

## TESTING.

Hydraulic cements:		Sands	12
Natural, 5 brands, samples	3,357	Gravels	3
Portland, 10 brands, samples	5,534	Gasolines	5
Asphalts:		Bricks	12
Trinidad, 5 cargoes, samples	35	Waters	11
Trinidad, refined	5	Oils	2
Cuban, crude	3	Coals	28
Asphaltic cements, samples	316	Bronzes	2
Asphaltic oils	5	Rubber packing	10
Residuum oils	23	Miscellaneous experiments, etc.	210
Surface mixtures	154		
Miscellaneous asphalts	12	Total	9,761

## HYDRAULIC CEMENTS.

The number of barrels inspected and the average results of tests of each brand of cement will be found in the following tables:

*Natural cements.*—The 3,357 samples represent 33,592 barrels, of which 3,210 were rejected.

*Natural cements.*

Brand.	Number of barrels.	Number of samples.	Per cent residue, 100-mesh sieve.	Initial set (minutes).	Per cent water used.		Temperature of air and water.	Tensile strength.			
					Neat cement.	2 parts sand.		Neat cement.		7 days, 3 parts sand.	
								1 day.	7 days.		
Cumberland hydraulic	6,893	689	16	19	30	14	75	158	222	179	
Cumberland and Potomac	8,337	833	14.6	18	31.8	14	73	175	264	171	
Cumberland Valley	4,503	450	18	17	30.6	14	82	134	232	135	
Potomac	2,569	256	16	20	29.7	14	77	107	202	124	
Round Top	11,290	1,129	16	15	31	14	74	128	200	120	

## PORTLAND CEMENTS.

The 5,534 samples of Portland cement represent 54,951 barrels, of which 2,641 were rejected.

*Portland cements.*

Brand.	Number of barrels.	Number of samples.	Per cent residue, 100-mesh sieve.	Initial set.	Per cent water used.		Temperature of air and water.	Tensile strength.		
					Neat cement.	3 parts sand.		Neat cement.		7 days, 3 parts sand.
								1 day.	7 days.	
Alpha.....	50	16	7	<i>h. m.</i> 22 11	18.5	9	74	487	878	365
Atlas.....	2,576	257	6	22 00	18	8	83	617	826	284
Krause <sup>a</sup> .....		19	6	3 00	19.5	9.5	76	466	871	228
Lehigh.....	19,200	1,920	7	22 25	18.7	8.9	74.4	388	850	319
Nazareth.....	4,900	490	3.7	22 00	19.3	9	73.4	346	700	279
Northampton.....	3,200	320	3.3	1 35	19.1	9.1	72.1	278	688	265
Old Dominion.....	19,700	1,970	6.6	22 00	18.8	9	71.9	467	878	284
Reading <sup>a</sup> .....		10	5	1 50	19	10	70	228	732	265
Sovereign.....	125	12	4	22 00	18	9	78	542	755	265
Vulcanite.....	5,200	520	7	22 18	19	9	78	400	635	265

<sup>a</sup> Test samples.

## INSPECTION OF CEMENT.

As there appears to be some misunderstanding about the rejection of the cement by this department, judging from a letter in a recent engineering paper, it may be well to explain here that of the cement rejected a very small per cent is really of inferior quality.

Of the rejected cement during the past year 52 per cent was rejected for being too quick setting, 4 per cent for being too slow setting, 33 per cent for being too coarse, and 12 per cent for being too low in tensile strength. It would be safe to say that over 80 per cent of the cement rejected was good, sound cement and perfectly suitable and desirable for some classes of work, the rejection having been because the cement did not meet the requirements of our specifications, which are drawn up to obtain a cement that will meet all requirements of the various branches of the engineer department. Such specifications are made necessary by our limited storage capacity, preventing the handling of more than one grade of cement.

It is seen from the above that by far the greatest number of rejected cements is due to quick setting. In nearly all the cases of quick-setting Portland cement the cause is owing either to an insufficient quantity or poor quality of the sulphate of lime used. It is remarkable how many times this error occurs when one considers how simple a matter it is to prevent, and it is not much to the credit of some of our manufacturers, who not only let it occur once, but time and time again.

In the inspection of all cement used in the public work for the District of Columbia a 10 per cent sample is taken and each sample tested separately. The failure of one sample to pass the specifications is considered sufficient cause for the rejection of the entire lot.

The methods employed in the inspection and delivery of cement are as follows: The cement used is of two classes—that which the District contracts for and furnishes for work to be done by the District, or for contract work that specifies that the District shall furnish the cement, and that cement which is to be furnished by a contractor on work which he is performing for the District. The first class alluded to is received from the cars at a District warehouse, where it is sampled under the direction of the superintendent of property. These samples are submitted to this department for inspection, and if the cement passes the tests the superintendent of property is notified, and his storekeeper issues that cement from the District warehouse on orders. If the cement is rejected the superintendent of property notifies the cement contractor to that effect, who hauls it out of the warehouse.

The other class of cement is usually stored in contractors' warehouses, and the inspection and issuing come directly and entirely under this department. When the contractor wishes to use cement he notifies this department, and an inspector is sent to his warehouse, where he samples the cement and submits it for testing. If the cement is accepted the warehouse inspector is notified, and is then allowed to issue this lot of cement to the contractor as he desires it. With each load of cement sent out by the warehouse inspector is a ticket stating the number of barrels and the lot number of the cement, which is handed to the inspector on the work for which the cement is intended. A record of the number of barrels of each lot and the location to which they are sent is kept by the warehouse inspector. It is a strict order of this department that the inspector see all cement loaded on the wagon before he shall issue a ticket for the load. If it is thought that the cement that has been tested and accepted for the District work has been removed or tampered with during the absence of the inspector from the warehouse, that lot of cement is rejected, and will only be accepted on a resampling and testing.

## ASPHALT PAVEMENTS.

The contract for paving with sheet asphalt during the past fiscal year was awarded to the Warner Quinlan Asphalt Company, of Syracuse, N. Y. This company proposed to do the paving with Trinidad land asphalt mined from the deposit on the Dundonald property, situated in the village of La Brea, Trinidad. The contract was awarded after a careful investigation of not only the character of the asphalt, but of the refinery of the company situated at Warner, N. J., one of their paving plants in operation in New York City, and of their pavements laid in Utica and Syracuse, N. Y.

After this investigation it was decided that this asphalt as refined by the Warner Quinlan Asphalt Company was of such a quality as to meet the requirements of the specifications—that is, that when this asphalt was fluxed with a desirable

residuum the resulting cement would not be inferior to a cement made of the best quality Trinidad asphalt and petroleum residuum.

After the awarding of the contract the Brennan Construction Company, of this city, made arrangements with the Warner Quinlan Asphalt Company by which they became the agent for this company and executed the work of the contract.

By request of the contractor the first three streets were paved with the Trinidad land asphalt fluxed with petroleum residuum alone, to demonstrate that good pavement could be laid with this material. In all the other work the Trinidad land asphalt was fluxed with California maltha and the petroleum residuum.

The question as to the relative merits of the Trinidad lake and land asphalt has been a much-discussed subject and the bone of contention in many a bitter fight.

In the early days of the asphalt industry it became apparent to some of the strongest asphalt interests that while it was possible to control the output of asphalt from the asphalt lake at Trinidad by the uniting of a few interests, it would be very difficult to control the output of the land deposits of asphalt, as they were so numerous and owned by so many different parties. It is very evident that this in a large measure was the primary cause and has been responsible for the war waged on land asphalt in the past. It is only justice, however, to state that there is considerable evidence that apparently points to lake asphalt being superior to that obtained from the land deposits when considered from a purely theoretical standpoint, and it is no discredit to those who were led to believe in the superiority of the former when the limited experience and knowledge of what is required of asphalts in pavement building is taken into account.

There is strong evidence to show that these two asphalts are of common origin, and that the land asphalt is the result either of an overflow of asphalt from the lake or that it is being forced up through crevices in the earth from the same source that is supplying the lake; or it may be that these deposits are a result of the combination of the two above conditions. But whatever the origin of these two asphalts, the lake is, as a rule, appreciably the softer, as this deposit, being so extensive in bulk, has lost less of the lighter oils and has been less subjected to molecular changes than has the asphalt from the land deposits. It is upon this the advocates of the lake asphalt base their claim of superiority over the land, and it is useless to mention here the numerous tests that have been devised to show that the lake asphalt is softer and contains more light oils than the land asphalt. Granted that the lake asphalt contains more light oils and is softer than the land, and for this reason requires the addition of less flux to soften it into a paving cement, does this make the lake superior to the land asphalt? From the following laboratory examination comparing the two asphalts it is seen that they are very similar in all respects. Where one excels in one property the other excels in another, so there is but little choice.

	Refined lake asphalt.	Refined land asphalt.
Chemical examination:		
Bitumen soluble in carbon disulphide.....per cent.....	55.74	54.39
Organic matter not bitumen.....do.....	7.88	7.52
Mineral matter.....do.....	36.38	38.07
On further examination the bitumens were found to be composed of:		
Bitumen soluble in naphtha (60 to 80 b. p.), petroleum.....do.....	62.90	59.40
Bitumen insoluble in naphtha (60 to 80 b. p.), asphaltene.....do.....	37.10	40.60
Physical examination:		
Parts residuum oil required to flux 100 parts of refined asphalt into cement.....do.....	17	22

These two refined asphalts were fluxed into paving cements having the same consistency at 77° F. by the addition of the same residuum to each. The lake asphalt required 17 parts of residuum to 100 parts of refined asphalt and the land asphalt required 22 parts of residuum to the 100 parts of refined asphalt in making the cements.

These asphalt cements gave on examination—

	Lake asphalt cement.	Land asphalt cement.
Bitumen soluble in carbon disulphide..... per cent	62.4	62.6
Penetration at 77° F. (100 gms. 5 seconds, No. 2 needle)..... do.	40	39
Heat test (samples heated in open tins in air bath):		
Loss on heating at 325° F. for 24 hours..... do.	1.53	1.06
Penetration before heating.....	40	39
Penetration after heating.....	19	24
Susceptibility to changes in temperature:		
Penetration at 32° F. (200 gms. 1 minute, No. 2 needle).....	12	12
Penetration at 77° F. (100 gms. 5 seconds, No. 2 needle).....	40	39
Penetration at 100° F. (50 gms. 5 seconds, No. 2 needle).....	90	75
Penetration at 115° F. (50 gms. 5 seconds, No. 2 needle).....	195	171
Ductility, length in inches to which asphalt cement could be drawn before breaking.....	13	11
Action of water on cements, appearance of cements after 48 hours immersion in water.....	(a)	(b)

<sup>a</sup> Badly attacked.

<sup>b</sup> Slightly attacked.

In reviewing the above results we see that the land refined asphalt is harder than the lake refined as it requires more residuum to soften the former into a paving cement of 40 penetration than it does the latter, but even though this be true it can hardly be looked upon as an objection after reviewing the results of the examination of the two cements. From this examination it is seen that the lake asphalt cement is inferior to the land asphalt cement in that it is slightly more altered by heat, it is more susceptible to changes in temperature, and is more readily acted upon by water. The land asphalt cement is inferior to the lake asphalt cement in being less ductile at 77° F. After a careful examination into the facts I believe that little or no foundation can be found for the claim that lake asphalt is superior in quality for paving purposes to land asphalt.

The reasons given for the superiority of the lake asphalt is that it contains a larger quantity of light oils, which are superior to any oil that can be added to the asphalt, and that the bitumen is more cementitious. On examination, the asphalt cement is found to be slightly more cementitious at ordinary temperatures between 50° F. and 90° F., but in practical use asphalt pavements are subject to much lower and much higher temperatures than these, and as the lake cement is more susceptible to changes in temperature it is very doubtful whether the lake is superior to the land cement at the extremes in temperature.

It is claimed, and I believe rightly so, that, as a rule, the pavements laid with land asphalt have been inferior to those laid with lake asphalt. This does not of necessity prove that the latter is superior to the former, but is easily accounted for in the fact that in the early days of the asphalt industry all the most experienced paving companies, controlling practically all the men with any experience at all, were induced by various concessions to use lake asphalt, so that the land asphalt pavements were laid by incompetent and inexperienced men who naturally produced inferior work.

A practical demonstration that tends to prove that the importance placed on the presence of these light oils in asphalt is much overestimated, is that one of the best pavements in the country was made with Gilsonite, which is considerably harder than land asphalt, softened into a paving cement by the addition of an oxidized petroleum residuum. The cement used in this pavement is entirely lacking in any natural light oils and is less cementitious at ordinary temperatures than is even a cement made of land asphalt. With this before us it is even more reasonable to claim that the absence of these light oils renders the land asphalt superior to the lake, because the asphalt would be less affected by heat, and having aged longer in its natural state will be less liable to undergo further changes when incorporated into a pavement. It is also seen that the land is superior to the lake in that it is less acted on by water. This is a very important point, as it is evident that the action of water on lake asphalt is responsible for more failures than from any other cause.

#### CUBAN ASPHALT.

During the past year the Brennan Construction Company used in about 5,000 square yards of sheet-asphalt pavement a cement made of Cuban asphalt fluxed with California maltha. This asphalt is mined at Bejucal, about 20 miles from

Habana, Cuba. The flux used to soften this asphalt into a paving cement was manufactured by the Sunset Refining Company, of Los Angeles, Cal.

The results of the laboratory examination of this asphalt and flux used to soften it into a paving cement will be found below.

The examination of the crude Bejucal asphalt is as follows:

	Per cent.
Water and light oils volatile at 225° F.....	3.61
After drying at 225° F. for 18 hours the sample analyzed:	
Bitumen soluble in carbon disulphide .....	71.64
Organic matter insoluble in carbon disulphide .....	4.30
Mineral matter (clay, sand, and some limestone) .....	24.30

A further examination of the bitumen soluble in carbon disulphide showed it to be composed of—

	Per cent.
Bitumen soluble in naphtha (76° B., 60 to 80 b. p.), petroline .....	50
Bitumen insoluble in naphtha (76° B., 60 to 80 b. p.), asphaltine .....	50

This asphalt is too hard in its natural state to be suitable to use as a paving cement, and has to be fluxed to the desirable consistency by the addition of a suitable oil.

The flux used was a refined asphaltic oil from the Sunset Oil Refinery, of Los Angeles, Cal.

On examination it gave:

Specific gravity, actual .....	0.9950
Specific gravity (degrees Baumé) .....	10.7
Flash point (° F.) .....	350
Bitumen soluble in carbon disulphide .....	per cent. 99.80
Bitumen soluble in naphtha (76° B. 60 to 80 b. p.) petroline .....	do. 92.90
Bitumen insoluble in naphtha (76° B. 60 to 80 b. p.) asphaltene .....	do. 7.10
Loss on heating for twenty-four hours at 300° F. ....	do. .81
Loss on heating for twenty-four hours at 400° F. ....	do. 6.88
Condition of residue in retort at 77° F., after twenty-four hours, 400° F., fluid.	

The results of the examination of a cement made by fluxing 100 parts of the crude Cuban asphalt with 65 parts of the Sunset Refining Company's asphaltic oil flux will be found in comparison with a Bermudez asphalt cement made of the best quality refined Bermudez asphalt fluxed with 13 parts of Constable Hook residuum.

On examination these cements gave:

	Cuban.	Bermudez.
Penetration at 77° F. ....	53	51
Bitumen soluble in carbon disulphide .....	84.60	85.80
Heat test:		
Loss on heating for 18 hours at 325° F. ....	do. 5.20	3.30
Penetration at 77° F., after above heating .....	do. 18	21
Hardened by heating .....	do. 290	240
Test for susceptibility to changes in temperature:		
Penetration at 52° F. (200 gms. 1 minute, No. 2 needle) .....	17.5	15
Penetration at 77° F. (100 gms. 5 seconds, No. 2 needle) .....	53	51
Penetration at 100° F. (50 gms. 5 seconds, No. 2 needle) .....	115	113
Penetration at 115° F. (50 gms. 5 seconds, No. 2 needle) .....	218	232
Ductility: Length in inches to which asphalt cement could be drawn at 77° F. ....	24	22

Neither of the above cements show the slightest signs of the action of water after two weeks' immersion in distilled water.

It is seen from the above results that the two cements compared are practically alike, and as the Bermudez cement is one of the best that has ever been used for paving, I am led to believe from this that a cement can be manufactured by a proper admixture of the Cuban asphalt and flux that will be equal to the best of paving cements.

*Crude Cuban asphalt.*—Three samples of crude Cuban asphalt have been examined during the past year, and gave on solution in carbon disulphide 71.64, 72.22, and 72.78 per cent. Judging from the amount of flux used in oiling each still, it showed a remarkable uniformity in quality.

*Crude Trinidad asphalt.*—The Barber Asphalt Paving Company, as formerly, has refined all the Trinidad lake asphalt for the use of the Cranford Paving Company.

During the past year 36 samples have been received, representing five cargoes. The asphalt received has been as uniform as usual, the maximum, minimum, and average being respectively 55.84, 53.69, and 54.56 per cent bitumen soluble in carbon disulphide.

As was mentioned in my last report, the great objection to Trinidad asphalt is the rapidity with which it disintegrates under the action of water, owing to the presence of soluble salts left after refining off the water. As the removal of these salts is very desirable, I visited the plant of the Maryland Paving Company, in Baltimore, in the past spring, where they had a plant in operation for washing the asphalt. The method employed consisted in first grinding the crude asphalt in a disintegrator and then agitating in water, thus washing out considerable of the salts, after which the asphalt was refined in the usual manner.

The plant consisted of a Denmead disintegrator, the capacity of which was 10 tons per hour, and a large circular vat with revolving paddles, in which the ground crude asphalt was washed. The process consisted in first grinding the crude asphalt, after which it was conveyed to the large vat, where it was washed in water, being agitated by revolving paddles. After being agitated a half an hour the paddles were stopped and the asphalt allowed to subside. The water was then drawn off and fresh water added and the agitation continued as before. After these two washings the crude asphalt was run off into the stills and refined. It is claimed, and I also believe from experiments, that the asphalt is much easier refined after it has been washed. Samples of the refined asphalt were taken, and on testing in comparison with the ordinary refined asphalt were found to be greatly improved, being much less rapidly attacked by water. The plant for washing the asphalt appeared so practical and at the same time so inexpensive and the asphalt was so much improved that it was thought advisable to insert the following clause in the specifications for sheet asphalt and asphalt-block pavement: "The asphalt cement must be either naturally or through artificial treatment of such character as to be unaffected by the action of water when tested as follows: The asphalt cement shall be tested by coating on a piece of glass and immersing this coated glass in distilled water at a temperature between 70° F. and 90° F. The surface of the asphalt cement must remain bright and show no corrosion or discoloration after immersion for a period of seven days."

*Refined asphalt.*—There were two cargoes of refined land asphalt received by the Brennan Construction Company during the year, from which 4 samples were taken and gave, on analysis, the following per cent bitumen: 54.1, 51.8, 53.8, 50.7. Judging from the quantity of residuum oil used in each still to flux this asphalt into a paving cement, it showed a remarkable uniformity in consistency. In the first three streets where residuum oil was alone used to flux the refined asphalt into the paving cement the proportion of oil used varied from 25 parts to 26½ parts to 100 parts of refined asphalt, the penetration of the cement varied from 33 to 41 at 77° F. This same uniformity was noticeable during the entire year.

The above demonstrates that although this asphalt is not quite as uniform as that from the Trinidad lake, it is far more so than Bermudez asphalt.

*Petroleum residuum.*—Under this heading I include all fluxes used for the softening of asphalts into paving cements. Of the total 33 fluxes examined, 15 have been for the Barber Asphalt Paving Company, 13 for the Brennan Construction Company, 2 for the Cranford Paving Company, and 3 specials. The Barber Asphalt Paving Company used in the first part of the year a flux manufactured at Constable Hook, N. J., from Eastern petroleum oil. Toward the end of the season they instituted the use of a residuum from Texas oil manufactured at their refinery at Constable Hook, N. J. This new flux being more asphaltic in character is an advantage over the residuums from Eastern petroleum oils, as it produces a cement that is more ductile and adhesive.

Of the 13 samples of residuum submitted by the Brennan Construction Company, 9 were manufactured from Eastern petroleum oil, 3 from asphaltic oil of California, and 1 from Beaumont, Tex., oil. The latter oil is a new flux recently gotten out by the Standard Oil Company. It is manufactured at their refinery at Bayonne, N. J., and is designated as either Bayonne residuum or as No. 55 flux. This oil makes an excellent flux, in fact the best that I have examined made from anything excepting the true asphaltic oils or malthas. The two samples of oil submitted by the Cranford Paving Company were from the Canfield Oil Company, being an Eastern petroleum residuum.

*Asphalt cements.*—The results of the tests made on asphalt cements submitted by the various paving companies during the past year will be found in the following table:

Table showing penetration of asphalt topping cement and binder during fiscal year ending June 30, 1902.

	Topping.			Binder.				
	Number of samples.	Penetration.		Number of samples.	Penetration.			
		Highest.	Lowest.		Average.	Highest.	Lowest.	Average.
Barber Asphalt Paving Co .....	12	50	39	41.8	4	81	70	77.5
Cranford Paving Co .....	97	59	40	48.4	57	115	55.5	90
Warner-Quinlan Asphalt Co .....	96	66	25	44.2	38	95	49.5	70.4
Washington Asphalt Block and Tile Co .....	2	18	13	15.5				

*Asphalt surface mixtures.*—During the year 154 samples were submitted by the three paving companies. The following table shows the maximum, minimum, and average per cent bitumen soluble in carbon disulphid found in the surface mixtures, and also the average mesh composition of the sands used in the paving mixtures. Included in this sand is all dust that was added to the mixture along with the mineral ingredients of the asphalt.

	Barber Asphalt Paving Co.	Cranford Paving Co.	Warner-Quinlan Paving Co.
Number of samples .....	11	87	56
Average per cent bitumen .....	9.6	8.24	4.4
Lowest per cent bitumen .....	9.1		11.7
Highest per cent bitumen .....	10.1	10.8	
Sand: Per cent retained on sieves having—			
20 mesh per linear inch .....	8	2.6	5
40 mesh per linear inch .....	21	16.6	26.1
60 mesh per linear inch .....	26	31.4	30
80 mesh per linear inch .....	15	19.6	13
100 mesh per linear inch .....	11	14.7	2.5
Passing 100 mesh per linear inch .....	19	14.8	18.4

I would recommend for the consideration of the Commissioners of the District of Columbia the advisability of increasing the scope of this department so as to include the testing of all materials bought under contract by the District government. Such examinations would without doubt result in a great saving to the District, as it would prevent the furnishing of poor quality and in many cases unsuitable materials. The materials that can be suggested offhand as being desirable to examine are, coal, coke, bricks of all kinds, lubricating oils, linseed oil, burning oils, and paints. Examinations of such materials could be made by this department without any addition to the present force and with but a slight increase in expense for suitable apparatus. Samples of nearly all these materials have been sent into this department during the past year, and the time consumed in the examination of the same has been sufficient to examine many times the number, owing to the inadequate apparatus and limited space, making it necessary to set up and take down the apparatus for each lot examined. I would recommend that the several branches of the engineer department and all departments of the District government that buy materials on contract submit such materials to this office for examination, to determine if they meet the requirements of specifications.

Before closing my report I would respectfully call your attention to the inadequate accommodations and equipment of this department. The accommodations are not only much too limited as to size, but the presence of a laboratory in such a building is a great source of danger from fire, and I am under constant anxiety lest an accident would cause not only the destruction of this department, but that of others who have property such as maps and records that would be impossible to replace. It is to be hoped that more extensive accommodation can be furnished this department, as we are greatly in need of additional apparatus for all branches

of the work so as to keep the laboratory abreast with the modern requirements in testing of engineering materials.

We are at present very poorly equipped even for the testing of cement, the cement-testing machine being of insufficient capacity and worn-out. The following is the special apparatus of which this department is greatly in need and for which I would request an additional appropriation: 2,000-pound cement-testing machine, one impact machine for testing asphalt blocks, etc., an apparatus for determining the ductility and strength of asphalt cements at various temperatures, and several other minor appliances. These could all be purchased at a sum not exceeding \$2,000. For the general contingent expenses I would request an appropriation of \$1,000.

The employees detailed to this department are four in number—one assistant receiving \$5 per day, paid out of appropriation for sewers; one inspector at asphalt paving yard, receiving at present \$3.50 per day; two skilled laborers, one performing some clerical work, at \$1.75 per day each. The inspector at the paving yard and one of the skilled laborers are paid from the appropriation for improvements and repair, the other skilled laborer is paid from an appropriation of the water department.

During the season when cement is being used an inspector is employed to keep track of the cement in the various contractors' warehouses, at a salary of \$2 per pay, paid from the appropriation for improvements and repair. During the past year two asphalt companies' yards, situated in different sections of the city, have been in operation, which necessitated the employing of an additional inspector for one of these yards. The inspector was detailed from the surface department and carried on their rolls.

Respectfully,

A. W. Dow,  
*Inspector of Asphalts and Cements.*

Maj. JOHN BIDDLE,  
*Corps of Engineers, U. S. Army,  
Engineer Commissioner, District of Columbia.*

#### REPORT OF THE ASSISTANT ENGINEER IN CHARGE OF STREET EXTENSIONS.

WASHINGTON, August 7, 1902.

MAJOR: I have the honor to submit the following report of the work on street extensions for the fiscal year ending June 30, 1902.

All special condemnations of streets as authorized by Congress have been completed during the past year, and a table is here included showing awards, etc., relating to the same. Maps, calculations, and various data have been furnished by this office in aid of these condemnation proceedings.

Reports and estimates have been made on the following condemnation bills introduced during this session of Congress: Albemarle street, Le Droit avenue, Elm street, Wilson and Sixth streets, Wright's road (or Eighth street), Quincy street, Bacon street, Erie street, Euclid place, School street, Kalorama avenue, Seventeenth street, Frankfort street (Langdon), Wisconsin avenue, New York avenue, R, Twenty-eighth, and M streets, Thirteenth and Fourteenth streets, Twenty-fourth street NE., Vermont avenue, California avenue, and Wyoming avenue.

A number of maps relating to new streets have been prepared for record with the surveyor's office, and the general maps relating to subdivisions and suburban tracts have been added to and brought to date. Many of these have been lithographed, and it is desired that others shall be copied in the near future.

A system of street naming has been adopted by the Commissioners for all streets outside of the city, and a map and table of the same was prepared for record. It was found, however, that no authority existed for a change of street names in the first section, and as it is desired to have uniformity in names over the entire District final action has been deferred. It is recommended that Con-

gress be requested to give the authority for this matter, and also to rename streets in the city where several names are given to a single minor street.

Street.	Act.	Date of award.	Date of confirmation.	Damages.	Benefits.	Court file.
Sixteenth street extended.	No. 195, approved Mar. 3, 1899.	1901. May 27	1902. Apr. 19	\$729,952.29	\$108,834.00	33
Pennsylvania avenue.	No. 225, approved Mar. 3, 1899.	July 24	1901. Sept. 20	1,939.00	1,019.00	52
Fifth street.....	do .....	Oct. 4 1902.	Nov. 19 1902.	5,293.58	5,293.58	55
Eckington place..	do .....	May 5 June 27	June 16 July 15	5,968.20	2,023.76	53
Adams Mill road	Sundry civil, Mar. 3, 1899; District of Columbia, Mar. 3, 1899; sundry civil, June 6, 1900.			6,062.88	.....	59

Very respectfully,

WM. P. RICHARDS,  
*Assistant Engineer.*

Maj. JOHN BIDDLE,  
*Engineer Commissioner, District of Columbia.*

WASHINGTON, September 29, 1902.

SIR: I have the honor to submit the following report of the operations in Rock Creek Park during the fiscal year ended June 30, 1902.

The work of the year may be said briefly to have consisted in the building of two masonry bridges and in the grading and macadamizing of 3 miles of park roads.

At the beginning of the year there existed a drive along the banks of Rock Creek from the Klinge road to the northern limit of the park, about 5 miles in length, having about 7,000 linear feet of macadam and the rest of a dirt or gravel surface. Another drive, known as the Ridge road, had been opened from the mouth of Broad Branch northward to the Military road, a distance of  $1\frac{1}{2}$  miles, but was not in a finished state. A completed macadam drive connected the Daniels road with the Military road and Broad Branch, and the Military road had been macadamized from Rock Creek to the Daniels road. Thus the park had isolated pieces of macadam roads which the work of the past year has connected, so that a continuous drive can be had over macadam roadway along the creek from Klinge road to the Military road, and thence, in way of return, by the Military and Ridge roads. The road along the creek is now known as Beach driveway.

A new entrance has been opened into the park by the way of Blagden avenue, considerable grading having been required for a distance of 800 feet in order to make this entrance possible. A temporary bridge has been constructed over Rock Creek in the line of this avenue so as to connect the same with Beach driveway and the Broad Branch road.

All macadam on Beach driveway was placed during the summer and fall, and additional grading was done between Klinge road and Pierce Mill during the spring in order to widen the old road from its old width of 15 feet to its present width of 30 feet. A part of this widening was through rock for a distance of about 200 feet, and this added considerably to the cost of the work. That part of Beach driveway between Pierce Mill and the site of the Argyle Mill was improved under the superintendent of county roads, as it was a part of an old highway.

The Ridge road was widened throughout its length, and a portion of it was macadamized with rock blasted out of the line of the road, the remainder being covered up with trap rock in the usual manner.

Two new arches have been built, both of them on the line of Beach driveway, one at the mouth of Broad Branch and the other at the site of the old Argyle dam. This last, known as the Boulder Bridge, has a facing of field stones gathered from places outside the park. The stones are placed so as to show no tool marks and very little of the cement at joints, and the bridge harmonizes well with its surroundings. It was designed under the direction of Capt. Lansing H. Beach, formerly Engineer Commissioner of the District.

A general statement of expenses incurred during the past year is as follows:

Amount of appropriation .....	\$37,500.00
Contract on Boulder Bridge, Talty & Allen .....	\$14,890.00
Cost of girders, Boulder Bridge .....	987.00
Royalty on Boulder Bridge .....	1,190.77
Inspection, Boulder Bridge .....	568.00
Cost of trap rock for macadamizing .....	3,454.95
Contract for macadam, Lyons Brothers .....	1,817.90
Paid for broken flint .....	360.00
Paid for sprinkler .....	340.00
Paid for 2-horse mower .....	38.00
Paid for hire of teams .....	5,000.00
Paid for hire of labor, dynamite, purchase of tools, etc .....	8,853.38

Some damage was done by two floods during the year, the dam at Pierce Mill being washed out on one occasion and the dirt road above the Military road being washed in a number of places. These floods exceeded any high waters during the last seven years, but were 6 or 7 feet lower than the greatest floods at Rock Creek.

#### PAST IMPROVEMENT OF THE PARK.

In addition to the above outline of work for the past year, I have the honor to submit the following history of operations in the park from the beginning of same until the present time.

The first work toward improving Rock Creek Park was begun in 1897 under the direction of Capt. Lansing H. Beach, Corps of Engineers, U. S. Army, who was then assistant to the Engineer Commissioner and secretary to the board of control of the park. There was no appropriation at that time and work was carried on with the help of the chain gang, and consisted merely in making more passable the existing roads or in opening up old roads which had been partly abandoned.

The first appropriation made for work in the park was one making available for this purpose the unexpended balance of the appropriation made for the purchase of land for the park; this balance amounted to about \$24,330.

Work was begun in May, 1899, by opening up a road along the creek between Blagden Mill and the Military road. An appropriation was made during the following year amounting to \$15,000, and for the fiscal year 1902 there was appropriated \$37,500. There was also appropriated during 1899 the sum of \$6,000 to be expended within the park limits for a roadway leading from Brightwood avenue across the north end of the park. Up to the 1st of November, 1902, or during all the time that Captain Beach was in charge, there had been expended out of park funds for the construction and repair of roads about \$55,000, and there has resulted from this expenditure 4 miles of completed macadam roadways and 3 miles of dirt roads. One and one-half miles of roadway within the park limits have been macadamized out of county road funds, the roadways so improved being direct highways through the park and connecting on either side of the park with some of the principal county thoroughfares.

#### HISTORY OF CONSTRUCTION OF ROADS.

Beginning at the southern boundary of the park and running northward along the banks of the creek work has progressed in the following manner:

The road along the east bank of Rock Creek between Klinge road and the Pierce Mill road, 3,500 feet in length, was first made passable over its entire length by grading done during the summer of 1899. Additional grading was done in 1900, and the road was finally macadamized in the summer of 1901 and widened during the spring of 1902. A part of this road, for a distance of 1,000 feet below Pierce Mill, was an old highway, but considerable grading was done in order to make it of easy grade. The part below Piney Branch was first caused to be opened by the building of a sewer in 1896, a dirt road being constructed over the top of the sewer.

The road on the west side of Rock Creek between Pierce Mill and Blagden Mill was graded and macadamized during the fall of 1901 out of funds for the repair of county roads.

The road along the bank of the creek from Blagden Mill to the Military road was opened and macadamized from May to December, 1899. Additional macadam

was put on the road during the following year. The construction of this road required some heavy grading, there being cuts of over 30 feet and a number of fills averaging 10 feet. A great deal of blasting was necessary at two or three points, and enough rock was obtained out of the line of the road to macadamize three-fourths of its length. Great care was taken to do as little damage to the topography as possible outside of the limits of the road, and considerable dirt was hauled from points at the two ends of the roads in order to prevent any defacement of the banks on either side. The cost of this road has been about \$15,000, and was paid out of the first appropriation made for the care and improvement of the park.

The roadway along the creek from Military road to the north crossing of Rock Creek was graded during the spring and summer of 1900, and about \$6,000 has been spent on its construction. It is merely a dirt road, no part of it being macadamized. A roadway and a temporary bridge were built under a special appropriation of \$6,000, made February 21, 1899, most of the work being done under contract. No macadamizing has been done on this roadway, but considerable material has been purchased for such work.

The roadway leading from the south end of the Daniels road to the Military road at Broad Branch was first opened in 1898 by operations of the chain gang. This road was a portion of the Military road opened during the war, but had been abandoned a number of years and had some very steep grades throughout most of its length. Additional grading was done out of Rock Creek Park funds during 1899, and the road was macadamized during the fall of that year.

The roadway leading to the hill just north of the mouth of Broad Branch, sometimes called the Ridge road, having a length of 7,000 feet, was laid out during 1899, and some little grading was done on it during that year by the chain gang. The grading on this road was completed during 1900 out of park funds, and it was macadamized during the year 1901 out of the park appropriation of \$37,500.

#### CONSTRUCTION OF CULVERTS AND BRIDGES.

There has been constructed in the park during the last four years 4 permanent arches, 1 steel viaduct, 6 culverts, and 5 temporary bridges.

A culvert over the mouth of Piney Branch was first constructed in 1899 at a cost of \$600, but was washed out during the next year, and the present culvert was built in 1900 at a cost of \$3,160, which was paid out of a special appropriation made for repairing damages done by the freshet of June, 1900.

The iron viaduct over Piney Branch was built during the year 1899 at a cost of \$10,567, which was paid from the appropriation for construction and repair of bridges in the District of Columbia.

The bridge over Rock Creek, in the line of Blagden avenue, is a temporary structure built by the chain gang during the summer and fall of 1901.

The culvert over the mouth of Broad Branch was built during the summer and fall of 1901 at a cost of \$4,300, paid out of the appropriation for construction and repair of bridges in the District of Columbia.

The culvert over Broad Branch, on the line of Military road, was built during 1898 by the chain gang and by labor paid out of the appropriation for construction and repair of bridges. The actual money expended was \$433.18.

The culvert on Beach driveway (Rock Creek drive), just north of the Military road, was built during August and September, 1899, at a cost of \$531.19, and was paid out of the appropriation for construction and repair of bridges in the District of Columbia.

The stone arch at the site of the old Blagden dam was built between October, 1901, and May, 1902, at a cost of \$17,653.77, which was paid out of the appropriation for the care and improvement of the park for the fiscal year ending June 30, 1902.

There are four temporary bridges in the park.

The construction of bridges and culverts is necessarily a large item, but all temporary bridges should be as quickly as possible replaced by bridges and arches of permanent character.

#### OPERATIONS OF THE CHAIN GANG.

The first work done by the chain gang was during the year 1897, and consisted of grading and shaping roads in the park then used as county roads. During the year 1898 the chain gang assisted in building the culvert over Broad Branch on the Military road and did grading on that road for a distance of  $1\frac{1}{4}$  miles, reducing the very steep grades of 10 per cent to a maximum of 7 per cent.

During 1899 the chain gang was employed in opening up what is known as the Ridge road, leading up the hill from the mouth of Broad Branch. The trees and underbrush along this line were cleared out and considerable grading was done by the gang, the finished grading being done by day labor.

During the year 1900 the gang was employed in removing the old bridge abutments on the line of the Pierce Mill or Linnean Hill road and in grading down the embankment at that point.

During the year 1901 the chain gang built the temporary bridge over the line of Blagden avenue and did some grading on Blagden avenue and on the Linnean Hill road.

In addition to the above work the gang has been employed during the spring and autumn of each year in cleaning gutters, repairing embankments, cutting out underbrush, and mowing the grass and weeds. Their operations have done very much toward making certain localities more accessible and attractive.

#### PLAN OF IMPROVEMENTS.

No comprehensive plan has, of course, been undertaken for the improvement of the park. The present lines of the roads follow the most natural topographical conditions, and are so located and graded that they will naturally weave in with any plan that may be finally devised for the more complete improvement of the park.

Beach driveway was so well indicated by marks of nature that very little choice was allowed in its location.

Another road, which is equally guided by topographical conditions, is the one following the ridge between Daniels road and the mouth of Broad Branch. A number of drives can yet be laid out without risk of error in following the small valleys leading to the east or west of Rock Creek in the northern portion of the park. One idea has always been held in view through all these improvements, namely, to disturb natural conditions as little as possible and to leave the park in a wild and rugged state, avoiding any attempt at finish or polish which usually follows the improvement of parks located near the center of a city.

All improvements in the park, from their inception until November 1, 1901, were under the close scrutiny and care of Captain Beach, and the appropriations for the work were obtained through his persistent efforts.

#### EXPENDITURES.

The expenditures during the fiscal year ending June 30, 1900, were as follows, all chargeable to the balance left from the purchase of land which was made available for the purpose and amounted to about \$24,330, viz:

Appropriation .....	\$24,330
Expenditures:	
Grading and macadamizing Beach driveway (Rock Creek drive) from Argyle or Blagden Mill to Military road .....	15,000
Grading and macadamizing Military road between Broad Branch and Daniels road .....	4,000
Grading and macadamizing the changed location of Linnean Hill road just north of Piney Branch .....	1,000
Grading and graveling Rock Creek road between Klinge road and Pierce Mill .....	2,500
Arch over Piney Branch .....	600
Grading along creek north of Military road .....	1,000
	<hr/> 24,100

The expenditures during the fiscal year ending June 30, 1901, were as follows:

Appropriation .....	\$15,000
Expenditures:	
Grading along Rock Creek from Military road to northern part of park .....	5,000
Grading the Ridge road from the mouth of Broad Branch to Military road .....	5,000
Grading and widening road along the creek between Pierce Mill and Klinge road .....	3,000
Widening road between Broad Branch and Argyle Mill .....	2,000
	<hr/> 15,000

## WORK RECOMMENDED FOR THE FISCAL YEAR 1904.

The most important work to be considered for the coming year, in my opinion, is the completion of the macadam drive along the banks of Rock Creek to the northern limit of the park.

Two permanent bridges are necessary on the line of Beach driveway, one at Rock Creek ford and another at the northern end of the park, at an estimated cost for both structures of \$25,000.

I believe, too, that Ross road should be completed as soon as possible, as it is an exceedingly picturesque side-hill drive leading from Military road to the mouth of Broad Branch.

The present  $5\frac{1}{2}$  miles of macadam roadway will in the near future need repair and will have to be made wider at a number of points. A stated sum should be appropriated each year for the proper care and maintenance of these roads. The road from Blagden Mill to the Military road has been in use for two years, and although still in good condition is beginning to show signs of wear. The road also needs protection from flood by a wall at certain points where the bank is high and very near the water's edge.

An additional sprinkler is very much needed as the experience of the past year shows that one sprinkler can not take care of the present roads.

A new feature of improvement that now suggests itself is the construction of footpaths through the park leading somewhere near and in the general direction of Beach driveway, but on the opposite side of the creek. If a start can be made during the coming year it is suggested that the work be commenced at Klinge ford and be carried northward as far as any appropriation would allow, and it is believed that at least \$10,000 should be allowed for this work, which would also include the building of places of shelter along the line of the path.

There are a number of fine springs in the park which need paths leading to them and likewise some shelter above them to prevent leaves and other substances from falling into them.

The Pierce Mill dam, which was a very pretty feature of the creek, was washed away during the high water of December, 1891, leaving the creek bed and banks near the mill in a rather unsightly condition. A new and more permanent dam would cost about \$2,500, and by use of bowlders could be made more attractive than the old one.

The entrance to Blagden avenue is now made over a temporary bridge which is liable to be destroyed by any high water, and it is suggested that a more permanent connection be made with the avenue by extending it along the creek to the Pierce Mill Bridge.

The following is the estimated cost of work recommended for the coming year, 1903-4:

*Estimate.*

Completing the grading and macadamizing of Beach driveway, 11,000 feet in length:	
Grading 10,000 cubic yards, at 25 cents	\$2,500
Macadamizing 5,000 cubic yards, at \$3.	15,000
Gutters, 3,700 square yards, at 50 cents	1,850
Two arches across Rock Creek on the line of Beach driveway	25,000
Completing Ross road, 6,000 feet long	10,000
Completing roadway leading from north end of Daniels road to Beach driveway	5,000
Purchase of sprinkler	350
Cost of running two sprinklers 150 days, at \$7	1,050
Paving creek bottom at Milk House ford	500
To restore Pierce Mill dam	2,500
Blagden avenue extension	5,000
Protecting Rock Creek banks	5,000
Footpaths and shelters	5,000
Care and repair of present macadam roads	5,000
	89,750
Add 10 per cent for engineering expenses, etc.	8,975
Total	98,725

It is recommended that some steps be taken looking to the location and mapping of particularly attractive points in the park, so that any plan that might be adopted in the near future would have regard to exceptional places, like the magnificent bunch of oaks and chestnuts now standing just west of the middle

# OPERATIONS OF THE ENGINEER DEPARTMENT, D. C. 177

service reservoir. The maps of the United States Coast and Geodetic Survey have been used with excellent results as an aid in past work, but they are on too small a scale for a very detailed study and a larger set of working maps should be acquired as soon as possible.

Very respectfully,

WM. P. RICHARDS,  
Assistant Engineer.

Maj. JOHN BIDDLE,  
Corps of Engineers, U. S. Army,  
Engineer Commissioner, D. C.

## REPORT OF THE SUPERINTENDENT OF PROPERTY.

WASHINGTON, August 21, 1902.

SIR: I have the honor to forward herewith detailed statement in quadruplicate as of July 1, 1902, showing expenditures of the property division of the engineer department for the fiscal year ending June 30, 1902.

1. Construction material purchased .....	\$268,084.60
2. Miscellaneous purchases .....	93,616.50
3. List of employees other than those on per annum rolls, and amounts paid to each .....	20,795.30
<b>Total .....</b>	<b>382,496.40</b>

Deliveries and payments under contract for furnishing paving and concrete sand, screened pebbles, curbing, Portland and natural cement are still in course of execution, and therefore this report is incomplete as to those items.

Very respectfully,

R. D. SIMMS,  
Superintendent of Property.

Maj. JOHN BIDDLE,  
Corps of Engineers, U. S. Army,  
Engineer Commissioner, D. C.

STATEMENT No. 1.—Showing amount of construction material purchased for issue from the District of Columbia property yards during the year ending June 30, 1902.

	Quantities.	Values.
<b>Terra-cotta sewer pipe, branches, bends, and reducers:</b>		
24-inch sewer pipe .....	feet. 3,021	\$2,518.13
21-inch sewer pipe .....	do. 4,305	2,771.70
18-inch sewer pipe .....	do. 7,560	3,255.45
15-inch sewer pipe .....	do. 7,437	2,401.04
12-inch sewer pipe .....	do. 19,142	4,226.17
10-inch sewer pipe .....	do. 8,582	1,616.76
8-inch sewer pipe .....	do. 3,305	454.96
6-inch sewer pipe .....	do. 12,604	933.07
8-inch to 6-inch reducers .....	number 30	15.00
6-inch sewer bends .....	do. 150	37.50
Vitrified invert sewer bricks .....	do. 700,861	11,388.99
Repressed vitrified paving blocks .....	do. 503,947	12,449.13
Repressed vitrified paving half blocks .....	do. 25,492	331.40
Sidewalk paving bricks .....	do. 311,438	3,650.40
Asphalt paving blocks .....	do. 810,383	47,255.93
Broken stone .....	cubic yards 31,436	30,808.03
Red sewer bricks .....	number 590,319	5,962.82
Paving and concrete sand .....	cubic yards 4,388	1,843.94
Screened sand .....	do. 638	312.87
Screened pebbles .....	do. 1,820	1,256.03
Curbing .....	linear feet 68,408	47,420.43
Bluestone basin tops .....	number 34	506.60
Portland cement .....	barrels 28,915	41,216.82
Natural cement .....	do. 17,816	11,225.85
Castings .....		4,087.15
Water boxes .....	number 942	516.36
Siphons, 6-inch .....	do. 6	123.00
Hauling broken stone .....		9,455.54
Storage on cement .....		839.53
Freight on broken stone .....		16,998.01
Hauling .....		2,161.71
Freight .....		2.28
<b>Total .....</b>		<b>268,084.00</b>

# 178      OPERATIONS OF THE ENGINEER DEPARTMENT, D. C.

STATEMENT NO. 2.—*Showing miscellaneous purchases made during the year ending June 30, 1902.*

Awnings purchased and repaired .....	\$11.90	Lumber .....	\$16,083.02
Badges, and repairs to .....	8.25	Lime .....	75.96
Bags .....	8.50	Oils, illuminating, engine, etc .....	1,459.36
Blank forms, printing and binding .....	4,070.73	Paints, glass, and oils .....	4,094.35
Blocks, pulley .....	9.98	Photographic supplies .....	27.50
Bicycle repairs .....	13.00	Pitch .....	233.91
Blue prints .....	147.25	Plows, and repairs to .....	230.54
Books, made to order .....	549.21	Plumbers' supplies .....	9,549.71
Boots, rubber .....	141.50	Saddlery .....	901.37
Castings .....	1,947.88	Quartz .....	21.34
Drugs .....	142.50	Rails, iron .....	977.58
Chemists' supplies .....	65.80	Stationery .....	2,230.02
Clocks .....	7.00	Surveyors' instruments, and re-	
Dry goods .....	107.79	pairs to .....	688.29
Engine, machinery, etc .....	579.40	Stone, rubble, etc .....	1,329.02
Electrical supplies .....	1,122.08	Subscriptions, magazines, etc .....	14.09
Fertilizer .....	63.60	Tickets, street-car .....	227.39
Fuel .....	10,709.98	Tinware .....	2,022.19
Furnace .....	100.00	Trees, maple .....	60.09
Furniture .....	1,192.91	Tools, and repairs to .....	570.04
Forage .....	8,441.63	Typewriters and repairs .....	327.39
Groceries .....	73.41	Valves and casings .....	5,742.49
Hose .....	1,485.71	Wagons, carts, buggies, and repairs .....	5,314.09
Hardware .....	7,799.48	Water meters .....	489.39
Horses .....	515.00		
Hydrants .....	884.00		
Ice .....	48.90		
		Total .....	93,614.39

STATEMENT NO. 3.—*Showing list of employees other than those on the per annum rolls, amount paid to each, and the various appropriations from which such payments were made.*

	Rate.	Assessment and permit work.		Improvement and repairs.	Cleaning and repairing sewers, and basins.	Main and pipe sewers.	Suburban sewers.	Arizona avenue sewer.
		Streets.	Sewers.					
R. D. Simms .....	\$5.00	\$55.00		\$297.30		\$84.00		
C. T. Shoemaker .....	4.50	54.00		216.54		63.00		
J. A. McDannel .....	4.00	52.00		198.21		56.00		
H. M. Spencer .....	4.00	28.00		198.20		56.00		
W. H. Edgar .....	3.50	50.00		198.21		56.00		
H. B. van der Las .....	2.50	36.50		148.65		42.00		
Chas. Hume .....	3.00	24.00		182.62		42.00		
Wm. Morris .....	1.75			92.42	\$19.25	28.00		
Geo. Arrington .....	1.75	21.00						
A. T. Batts .....	1.75	21.00		83.21	19.25	28.23	\$3.59	\$0.17
Wm. Donaldson .....	4.00	52.00		198.21	104.00	61.71	11.87	15.15
H. M. Dickinson .....	3.25	32.50		180.55	84.50	50.14	9.64	39.32
W. H. Voss .....	3.00	30.00		148.65	78.00	42.00		
W. J. W. Grey .....	3.00	30.00		144.15	78.00	46.28	8.90	39.42
G. T. Hammer .....	2.00	24.00			51.56	16.88	61.61	
J. K. Hammer .....	2.00					2.85	29.45	26.11
J. Wm. McConchie .....	2.50			136.51	27.50	38.57	7.42	32.85
Blacksmiths .....	3.25							
	2.00	61.38			135.33	92.99	223.68	69.53
	2.50							
Wheelwright and painter .....	2.50					2.75	5.71	.57
Labor .....	1.75							
	1.50	173.25		68.37	484.50	125.30	570.78	163.92
Total .....		771.63		2,422.00	1,081.89	932.65	932.65	373.10

STATEMENT NO. 3.—Showing list of employees, etc.—Continued.

	Rate.	Low area trunk sewer.	Boundary sewer.	Paving road-ways under permit system.	Contingent expenses engineer stabiles.	Extension of high-service system.	Pumping expenses and pipe distribution.	Purchase and repair pumps.
R. D. Simms.....	\$5.00					\$144.00	\$78.00	
C. T. Shoemaker.....	6.00							
J. A. McDannel.....	4.50					114.50	60.00	
H. M. Spencer.....	5.00					96.00	52.00	
W. H. Edgar.....	4.00					44.00	52.00	
H. B. van der Las.....	3.50					96.00	52.00	
Chas. Hume.....	4.00					72.00		
Wm. Morris.....	2.50					70.50	36.00	
Geo. Arrington.....	3.00					46.00	15.00	
A. T. Batts.....	1.75							
Wm. Donaldson.....	2.00	\$2.57				40.25	29.75	
H. M. Dickinson.....	1.75	8.48	\$52.00			44.00		
W. H. Voss.....	3.25	6.89				78.00		
W. J. W. Grey.....	3.00					72.00		
G. T. Hammer.....	3.00	6.36	30.00			30.00		
J. K. Hammer.....	2.00			\$26.44				
J. Wm. McConchie.....	2.00	4.23			\$26.44	52.00	26.00	
	2.50	5.29		32.76		57.50		
Blacksmiths.....	3.25							
Wheelwright and painter.....	2.00	58.38	117.00	78.07	74.75	32.50	74.75	\$42.25
Labor.....	2.50							
	2.50	52.49	65.00					
	1.75							
	1.50	115.63	198.50	158.55	204.00	68.50	106.00	7.75
Total.....		290.82	457.50	290.82	304.75	1,157.75	581.50	50.00

	Rate.	General expenses electrical department.	Parking commission.	East side intercepting sewer.		Sewage pumping station.	Repairs to streets, avenues, and alleys.	Side-walks and curbs.
				Between Twenty-second and A. N. E. and Twelfth street SE.	From Twelfth street SE. to pumping station, foot of New Jersey avenue.			
R. D. Simms.....	\$5.00						\$345.53	\$18.12
C. T. Shoemaker.....	6.00							
J. A. McDannel.....	4.50						167.40	15.10
H. M. Spencer.....	5.00						243.03	12.08
W. H. Edgar.....	4.00			\$52.00			267.03	12.08
H. B. van der Las.....	3.50						243.02	12.08
Chas. Hume.....	4.00							
Wm. Morris.....	2.50					\$3.00	143.27	9.06
Geo. Arrington.....	3.00						127.06	8.36
A. T. Batts.....	3.00						90.29	6.04
Wm. Donaldson.....	1.75							
H. M. Dickinson.....	2.00						83.57	5.28
W. H. Voss.....	1.75					52.00	191.02	12.08
W. J. W. Grey.....	4.00					42.25	164.95	9.06
G. T. Hammer.....	3.25						143.28	9.06
J. K. Hammer.....	3.00						143.27	9.06
J. Wm. McConchie.....	2.00			4.48	\$20.77	26.00	61.57	
	2.50	\$28.00					119.90	11.65
Blacksmiths.....	3.25							
Wheelwright and painter.....	2.00		\$45.50	11.83	54.92	116.92	161.63	
Labor.....	2.50					76.57		
	2.50							
	1.75	65.63	3.75	34.82	148.15	149.58	508.60	15.90
	1.50							
Total.....		93.63	49.25	103.13	223.84	493.32	3,200.00	185.00

## 180 OPERATIONS OF THE ENGINEER DEPARTMENT, D. C.

STATEMENT NO. 3.—*Showing list of employees, etc.*—Continued.

	Rate.	Con- struction of county roads.	Repairs to county roads.	Bridges.	School build- ings.	Retain- ing wall, Sherman avenue.	Repairs.	
							Market houses.	Police stations.
R. D. Simms	\$5.00 6.00	\$311.47	\$161.52	\$253.06	\$78.00			
C. T. Shoemaker	4.50 5.00	170.60	8.64	223.22	65.00			
J. A. McDannel	4.00	207.64	107.67	175.37	52.00			
H. M. Spencer	4.00	207.64	107.68	175.37				
W. H. Edgar	3.50 4.00	207.65	107.68	175.36	52.00			
H. B. van der Las	2.50 3.00	155.73	80.76	131.53				
Chas. Hume	3.00	155.73	75.35	125.78				
Wm. Morris	1.75 2.00	71.00	51.98	85.68	26.00			
Geo. Arrington	1.75							
A. T. Batts	1.75	68.10	68.11	74.98				
Wm. Donaldson	4.00	103.65	107.68	223.36				
H. M. Dickinson	3.25	84.22	79.37	140.48				
W. H. Voss	3.00	77.74	80.76	170.53				
W. J. W. Grey	3.00	76.24	80.75	131.54				
G. T. Hammer	2.00	15.74						
J. K. Hammer	2.00			50.00				
J. Wm. McConchie	2.50 3.25	69.01	69.41	113.26				
Blacksmiths	2.00 2.50	41.30	74.75					\$25.00
Wheelwright and painter	2.50 2.50							
Labor	1.75 1.50	104.45	17.89	49.72		\$33.50	\$16.00	7.30
Total		2,128.00	1,280.00	2,309.04	273.00	33.50	16.00	32.30

	Rate.	Repairs.		Street lighting.	Main sewer through lands of W. W. Davidge.	Work- house for males.	Chem- ical en- gine house, Congress Heights.	Total.
		Engine houses.	Schools.					
R. D. Simms	\$5.00 6.00							\$1,846.00
C. T. Shoemaker	4.50 5.00							1,158.00
J. A. McDannel	4.00							1,352.00
H. M. Spencer	4.00						\$52.00	1,352.00
W. H. Edgar	3.50 4.00							1,250.00
H. B. van der Las	2.50 3.00		\$6.00			\$39.00	34.50	901.00
Chas. Hume	3.00					30.00	34.50	871.50
Wm. Morris	1.75 2.00		26.00			10.00		567.75
Geo. Arrington	1.75							21.00
A. T. Batts	1.75				\$7.69			533.75
Wm. Donaldson	4.00				25.39			1,352.00
H. M. Dickinson	3.25				20.63		4.00	1,002.50
W. H. Voss	3.00		39.00			39.00		939.00
W. J. W. Grey	3.00		39.00		19.04			921.00
G. T. Hammer	2.00							257.75
J. K. Hammer	2.00		46.00		12.70			335.50
J. Wm. McConchie	2.50 3.25				15.87			752.50
Blacksmiths	2.00 2.50	\$32.50		\$35.00	15.87			1,671.17
Wheelwright and painter	2.50 2.50				12.21			215.00
Labor	1.75 1.50		85.00	58.50	57.13			3,791.17
Total		32.50	241.00	93.50	186.53	127.00	125.00	30,735.30

## REPORT OF THE PERMIT CLERK.

WASHINGTON, August 11, 1902.

MAJOR: Permits issued during the fiscal year ended June 30, 1902, were:

Water connections.....	1,341	
Water repairs.....	1,086	
Water specials.....	307	
		2,734
Sewer connections.....	1,552	
Sewer repairs.....	939	
Sewer specials.....	692	
		3,183
Gas and electric lighting connections.....	1,339	
Gas and electric lighting repairs.....	229	
Gas and electric lighting specials.....	21	
		1,589
Gas mains, lay.....		78
Electric conduits, construct (U. S. E. L. and P. E. P. Co.'s).....		40
Electric conduits, construct and repair (telegraph and telephone).....		8
Electric conduits, replace cables in.....		25
Electric railroad conduits, connect with sewer.....		1
Alleys, close temporarily.....		6
Alleys, grade.....		1
Alleys, place curb in.....		1
Alleys, place guards in, on fences.....		2
Alleys, put steam pipe in.....		1
Alleys, place well digger in, to drill well.....		1
Alleys, repair pavement.....		2
Arch, repair, in roadway.....		2
Bridge, construct foot.....		1
Bridges, haul loads in excess of 4 tons over.....		11
Bridges, place, over gutters.....		5
Bridges, replace electric cables on.....		1
Barbed wire, place on fence.....		1
Conduits, construct (United States Government).....		2
Copings, construct, back of sidewalks.....		213
Curb, lower.....		1
Derrick, operate, in roadway.....		1
Drain pipes, lay and clear.....		8
Driveways across sidewalks, construct or repair.....		26
Excavations, make, in public space.....		7
Engines and steam shovels, move over streets.....		28
Fences, erect, to inclose parkings.....		361
Fences, repair, inclosing parkings.....		418
Gas service pipe, extend from building line.....		1
Guard stones, place in alleys.....		9
Gutters, lay.....		6
Hitching posts, place at curb.....		8
Lantern, place on post.....		1
Leads, lay across parkings.....		575
Leads, repair across parkings.....		328
Lights, hang electric and erect gas.....		49
Manholes, adjust to grade.....		4
Manholes, construct on electric conduits.....		3
Manholes, remove cover and enter sewer.....		3
Material, take from streets.....		14
Material, fill in streets.....		10
Parkings, grade.....		113
Parkings, pave.....		27
Parkings, repave.....		13
Parkings, remove pavement and sod.....		15
Parking, place material on, temporarily.....		1
Paving, take sample of, from street.....		1
Pins, drive, in roadway for guy wire.....		1
Poles, erect, replace, and remove telegraph and telephone.....		478
Roadways, close, temporarily.....		8
Roadways, operate stone crusher in.....		2

# 182 OPERATIONS OF THE ENGINEER DEPARTMENT, D. C.

Roadways, repair.....	7
Sewer, connect down spout with.....	1
Sewer, enter.....	1
Sidewalks, haul and drive across.....	62
Sidewalks, lay.....	47
Sidewalks, occupy, for business purposes.....	9
Sidewalks, repair.....	54
Steps on parkings, erect, replace, or repair.....	297
Stop-cock boxes, gas, adjust to grade.....	24
Streets, grade.....	4
Trees, remove.....	12
Trees, whitewash.....	35
Trees, attach guys to.....	4
Tree space, pave.....	4
Walls, building retaining, on parking.....	25
Water tables, lay and repair.....	71
Wires, string overhead.....	115
Wires, overhead connections (U. S. E. L. and P. E. P. Co.'s).....	24
Wires, overhead telephone connections.....	215

## RAILROAD COMPANIES.

Anacostia and Potomac River Railroad Company.....	12
Brightwood.....	1
Capital.....	1
Capital Traction.....	5
City and Suburban.....	4
Columbia.....	3
Georgetown and Tennallytown.....	1
Metropolitan.....	6
Washington and Great Falls.....	1
Baltimore and Ohio.....	4
Chesapeake and Ohio.....	1
Baltimore and Potomac.....	7

## UNITED STATES GOVERNMENT.

Bureau of Engraving and Printing.....	1
Coast Survey.....	1
Department of the Interior.....	3
Insane Asylum.....	1
Officer in charge new Government Printing Office.....	2
Officer in charge Public Buildings and Grounds.....	2
Officer in charge Washington Aqueduct.....	1

Grand total..... 11,496

There has been an increase of 974 in the number of permits issued as compared with the fiscal year ended June 30, 1901; also in the amount of money paid to the collector of taxes, District of Columbia office, for fees, as will be shown by his report.

Permits issued during the fiscal year 1900-1901.....	10,522
Permits issued during the fiscal year 1901-2.....	11,496

The following table shows the number of permits issued during the last five years, and the amount of money paid for permit fees to the collector of taxes, District of Columbia, during that time:

Fiscal year.	Permits issued.	Fees paid.
1897-98.....	10,465	\$7,845
1898-99.....	11,310	7,682
1899-1900.....	10,569	6,797
1900-1901.....	10,522	6,563
1901-2.....	11,496	7,334

One thousand three hundred and twenty-seven communications have been referred to this office, briefs made on cards, the permits necessary written, the

papers indorsed with action taken and returned to the record office of the engineer department, or through that office to the division having charge of the inspection of the work for which the permits were issued.

Eighty-one names were recorded for laborers' places on District work during the year.

Very respectfully,

H. M. WOODWARD,  
Permit Clerk, District of Columbia.

Maj. JOHN BIDDLE,  
Corps of Engineers, U. S. Army,  
Engineer Commissioner, District of Columbia.

### REPORT OF THE CHIEF CLERK.

WASHINGTON, July 8, 1902.

MAJOR: I have the honor to submit the following report for the fiscal year ended June 30, 1902:

Communications received, briefed, and recorded.....	11,609
Indorsements, references, and reports thereon.....	58,045
Letters and orders prepared.....	3,842
Copies of contracts drawn.....	480
Vouchers and bills prepared, recorded, and forwarded.....	6,266

Schedules of bids received during the fiscal year for work and materials furnished, and statements of contracts for street improvements, sewers, buildings, construction material, supplies, and miscellaneous work, are herewith.

The following is a list of employees who are paid from various appropriations, and are employed in the record office: One clerk, at \$4.50 per diem, surface appropriations; three clerks, at \$4 per diem, pro rata, sewer, water, and surface appropriations; one clerk, at \$3.25 per diem, pro rata, sewer, water, and surface appropriations.

Very respectfully,

A. Y. LAKENAN,  
Chief Clerk, Engineer Department.

Maj. JOHN BIDDLE,  
Corps of Engineers, U. S. Army,  
Engineer Commissioner, District of Columbia.

### Statement of contracts for the construction of sewers for the fiscal year 1902.

No.	Date.	Name of contractor and address.	Location.	Character of work.
2965	July 12, 1901	John Jacoby, Wilmington, Del.	From Third and Cincinnati streets through lands of W. W. Davidge and Trinity College to Michigan avenue.	Construct main circular sewer.
3009	Aug. 8, 1901	Lyons Bros., Washington, D. C.	Princeton street, between Sherman avenue and Brightwood avenue.	Construct 12-inch pipe sewer.
3037	Oct. 23, 1901	E. G. Gummel, Washington, D. C.	Harvard street, between Sherman and Brightwood avenues.	Construct 18-inch pipe sewer.
3043	Nov. 9, 1901	James A. Coyle, Washington, D. C.	Between New Jersey avenue and N. SE., and New Jersey avenue and First street SE.	Construct and complete 3-foot 6-inch circular sewer.
3044	Nov. 13, 1901	W. F. Brenizer, Washington, D. C.	Across square 380. O street SW., between Delaware avenue and James Creek Canal.	Construct pipe sewer. Do.
3048	Nov. 22, 1901	Lyons Bros.	B street SW., between Sixth and Tenth.	Construct 3-foot 6-inch, 3-foot 8-inch sewer.
3061	Apr. 16, 1902	W. F. Brenizer.	Connecticut avenue NW., Rock Creek to Cathedral avenue.	Construct 4-foot, 2.75 by 4.125, 2 by 3 foot sewer.
			West abutment of Massachusetts avenue bridge over Rock Creek.	Construct, complete, and keep in repair circular sewer.
			Sewerage pumping station, New Jersey avenue SE.	Construct cofferdam, facade walls, outlet section, tide-gate chambers, etc.

## 184 OPERATIONS OF THE ENGINEER DEPARTMENT, D. C.

*Statement of contracts for the construction of sewers for the fiscal year 1902—Continued.*

No.	Date.	Name of contractor and address.	Location.	Character of work.
3002	May 29, 1902	Andrew Gleeson ....	East side intercepting sewer, "Sec. B."	Construct sewer left uncompleted by John Jacoby.
3003	.....do.....	M. F. Talty .....	From Third and Cincinnati streets, through lands of W. W. Davidge and Trinity College, to Michigan avenue, Eighth N.E., between Hartford and Joliet.	Construct egg-shaped sewer.
3005	June 23, 1902	W. F. Brenizer Co. ....	Joliet street, between Seventh and Eighth; North Capitol street, between I and K.	Construct new invert.
3008	June 27, 1902	Arthur Cowsill .....	Seventeenth and E streets to Twenty-first and A N.E.	Construct extension of Boundary sewer left uncompleted by John Jacoby.

*Statement of contracts for the improvement of streets, avenues, and roads for the fiscal year 1902.*

No.	Date.	Name and address of contractor.	Location.	Character of work.
2976	July 24, 1901	Warner-Quinlan Asphalt Co.	Where ordered .....	Laying standard asphalt pavement.
3012	Aug. 13, 1901	Carmody & Hough..	South Dakota avenue, Myrtle avenue, Carlton avenue, Central avenue, Indianapolis street, Vista street, in Woodridge subdivision.	Grade.
3013	.....do.....	.....do.....	Erie street, Pennsylvania avenue extended, California avenue, Providence street, Trenton street, Benning and Anacostia roads.	Grade, set curb and pave gutters.
3014	Aug. 14, 1901	W. F. Brenizer .....	Third street N.E., L to Florida avenue.	Grade.
3028	Sept. 23, 1901	Geo. B. Mullin .....	Connecticut avenue west of Rock Creek from Klingie Ford Bridge.	Grading.
3052	Dec. 6, 1901	Cogan Bros. & Forchner.	Massachusetts avenue from T to Observatory Circle.	Grade.
3053	Jan. 9, 1902	Colburn Paving Co..	Connecticut avenue, Columbia road to Wyoming avenue; California avenue from Columbia road westward.	Do.
3058	Mar. 8, 1902	M. F. Talty .....	Bunker Hill road between Harewood road and Baltimore and Ohio R. R.	Improve by grading, gutters, curb, and macadam.
3059	Mar. 19, 1902	W. L. Swormstedt...	Joliet street, between Wisconsin avenue and Tunlaw road.	Complete work of grading, left uncompleted by John Jacoby.

*Statement of contracts for furnishing construction material for fiscal year 1902.*

No.	Date.	Name and address of contractor.	To furnish—
2947	July 1, 1901	Potomac Terra Cotta Co., Washington, D. C. ....	Terra cotta material.
2951	June 28, 1901	J. H. McGill, Washington, D. C. ....	Natural cement.
2960	July 9, 1901	American Sewer Pipe Co., Pittsburg, Pa. ....	Vitrified sewer bricks.
2961	.....do.....	.....do.....	Terra cotta sewer pipe.
2969	July 12, 1901	Angus Lamond, Washington, D. C. ....	Terra cotta pipe blocks, etc.
2978	July 17, 1901	Rowan Granite Co., Salisbury, N. C. ....	Granite curb.
2981	July 19, 1901	Savage Fire Brick Co., Keystone Junction, Pa. ....	Sewer invert bricks.
2991	July 24, 1901	Georgia Rough and Cut Stone Co., Augusta, Ga. ....	Granite curb.
2992	July 25, 1901	Frederick Brick Works, Frederick, Md. ....	Paving brick.
3070	July 31, 1901	Dunn's Mountain Granite Co., Woodside, N. C. ....	Curbing.
3045	Nov. 1, 1901	Warren Foundry and Machine Co., New York City.	Cast-iron water pipe.
3050	Dec. 3, 1901	Camden Iron Works, Philadelphia, Pa. ....	Do.
3054	Jan. 14, 1902	National Mortar Co., Washington, D. C. ....	Portland cement.
3055	Jan. 24, 1902	Northampton Portland Cement Co., New York City.	Do.
3056	Feb. 10, 1902	M. J. Drummond & Co., New York City .....	Cast-iron water pipe.

*Statement of construction, hauling, and miscellaneous contracts for fiscal year 1902.*

No.	Date.	Name and address of contractor.	Description.
2953	July 6, 1901	Jas. Nolan & Sons, Washington, D. C.	Repair and change plumbing in Lincoln School, Second and C streets SW.
2954	July 3, 1901	American Electrical works, Phillipsdale, R. I.	Cables for telegraph and telephone service.
2955	July 5, 1901	Pavarini & Greer, Washington, D. C.	Construct 4-room school building on lots 61 to 68, block 5, Kenilworth.
2956	July 9, 1901	S. S. Shedd & Bro., Washington, D. C.	Repair and change plumbing in Randall School building, First and I SW.
2956	July 12, 1901	Washington Gas Light Company, Washington, D. C.	Operate, repair, and maintain street-lighting plant.
2957	.....do.....	Andrew Gleeson, Washington, D. C.	Excavate for foundation for new pumping station.
2958	July 22, 1901	S. S. Shedd & Bro., Washington, D. C.	Repair and change plumbing in Mott School building, Sixth and Trumbull streets.
2959	July 25, 1901	Lyons Bros., Washington, D. C.	Construct rubble masonry wall at Garfield Hospital grounds.
3001	Aug. 2, 1900	Jas. Nolan & Sons, Washington, D. C.	Repair and change plumbing in Addison School building, P street NW, between Thirty-second and Thirty-third streets.
3004	Aug. 12, 1900	Lyons Bros., Washington, D. C.	Crush, haul, and spread stone in Rock Creek Park.
3010	Aug. 10, 1901	Matthew Myers, Washington, D. C.	Grade school site, lots 7, 8, 9, and 10, square 938.
3011	.....do.....	Allis-Chalmers Co., Milwaukee, Wis.	Equipment for sewerage pumping station.
3015	Aug. 24, 1901	Gleeson & Humphrey, Washington, D. C.	Construct complete 4-room school building, lot 21, block 26, Petworth.
3016	.....do.....	.....do.....	Construct complete 8-room school building on lots 2-10, square 615.
3017	.....do.....	Cranford Paving Co., Washington, D. C.	Lay cement sidewalks where ordered.
3018	Aug. 28, 1901	H. I. Gregory, Washington, D. C.	Construct mechanical heating and ventilating apparatus, lots 18, 19, 20, and 21, block 26, Petworth.
3019	Aug. 29, 1901	Jas. M. Dunn, Washington, D. C.	Construct complete 12-room school building, lots 2 and 3, Keating's subdivision of Prospect Hill.
3023	Aug. 15, 1901	Potomac Electric Power Co.	Furnish, operate, maintain incandescent electric lighting for streets.
3025	Sept. 11, 1901	E. J. Hannan, Washington, D. C.	Construct complete frame toilet building with sewer and water connections, etc.
3029	Sept. 24, 1901	Pavarini & Greer, Washington, D. C.	Construct complete a brick stable rear of lot 10, square 872.
3030	Sept. 30, 1901	Wm. E. Mooney, Washington, D. C.	Construct complete new boiler house with plumbing at Jefferson School building.
3033	Oct. 12, 1901	National Electrical Supply Co., Washington, D. C.	Furnish, deliver, and install 2 tubular boilers, etc., in boiler house of Curtis and Addison schools.
3034	Oct. 11, 1901	Talty & Allen, Washington, D. C.	Construct complete, etc., Melan arch bridge across Rock Creek on line of Rock Creek drive.
3035	Oct. 12, 1901	Geo. A. Fuller Co., Baltimore, Md.	Construct complete pumping station building on Trumbull street, between First and Fourth NW.
3038	Oct. 24, 1901	Brennan Construction Co., Washington, D. C.	Grade and construct foundations for masonry bridge across Rock Creek on line of Connecticut avenue extended.
3039	Oct. 26, 1901	Pavarini & Greer, Washington, D. C.	Construct and complete brick stable rear truck house F, on Whitney avenue, between Thirteenth and Fourteenth.
3041	Oct. 31, 1901	Heine Safety Boiler Co., St. Louis, Mo.	Furnish, deliver, and erect steam boilers for Manual Training School, P street NW, between First and Third.
3040	Nov. 6, 1901	A. Fred Jorss, Washington, D. C.	Furnish, erect, and complete wrought-iron fence around Western High School grounds, Thirty-fifth street NW, between T and U.
3042	Oct. 29, 1901	Michigan Brass and Iron Works, Detroit, Mich.	Furnish and deliver, complete and ready for operation, water gates for Trumbull street pumping station.
3047	Nov. 11, 1901	Allis-Chalmers Co., Milwaukee, Wis.	Design, build, deliver, erect, etc., a complete water end for pumping engine at Trumbull street pumping

## 186 OPERATIONS OF THE ENGINEER DEPARTMENT, D. C.

*Statement of construction, hauling, and miscellaneous contracts for fiscal year 1902—Continued.*

No.	Date.	Name and address of contractor.	Description.
3049	Nov. 22, 1901	Brennan Construction Co., Washington, D. C.	Construct complete and keep in repair power house and nurses' home at Providence Hospital.
3051	Nov. 12, 1901	M. B. Casey, Washington, D. C.	Furnish and connect plumbing fixture in Birney School.
3057	Feb. 10, 1902	Westinghouse, Church, Kerr & Co., New York City.	Furnish, deliver, and erect a steam-generating equipment at the Trumbull street pumping station.
3060	Apr. 15, 1902	Johnson & Morton, Utica, N. Y.	Furnish and install switchboards, Trumbull street pumping station.
3064	June 17, 1902	Pawling & Harnischfeger, Milwaukee, Wis.	Furnish and erect motor electric traveling crane at Trumbull street pumping station.
3066	June 26, 1902	William Rothwell, Washington, D. C.	Construct complete a dead house at Washington Asylum.
3067	....do.....	United States Cast Iron Pipe and Foundry Co., Philadelphia, Pa.	Furnish and deliver cast-iron flanged pipe specials at Trumbull street pumping station.

*Statement of contracts for general supplies, fiscal year 1902.*

No.	Date.	Name and address of contractor.	To furnish—
2948	July 2, 1901	Wm. A. Pate, Washington, D. C.	Saddlery.
2949	July 1, 1901	Edw. Stevens, Washington, D. C.	Drugs.
2950	July 3, 1901	Patent Record Printing Co., Washington, D. C.	Blank forms and printing.
2952	June 28, 1901	Julius Lansburgh, Washington, D. C.	Furniture.
2956	July 8, 1901	Rudolph, West & Co., Washington, D. C.	Do.
2957	July 9, 1901	B. Rich & Sons, Washington, D. C.	Boots and shoes.
2959	....do.....	Cuyler & Mohler, Washington, D. C.	Plumbers' materials.
2962	July 11, 1901	Judd & Detweiler, Washington, D. C.	Blank forms and printing.
2963	July 12, 1901	Thos. R. Riley, Washington, D. C.	Lumber.
2964	....do.....	John Mitchell, jr., Washington, D. C.	Plumbers' material.
2968	July 13, 1901	W. M. Galt & Co., Washington, D. C.	Groceries, flour, etc.
2970	July 10, 1901	Globe Printing Co., Washington, D. C.	Blank forms and printing.
2971	July 12, 1901	Chas. White & Co., Washington, D. C.	Miscellaneous castings.
2972	July 15, 1901	J. F. Buchanan & Co., Washington, D. C.	Electrical supplies.
2973	....do.....	Z. D. Gilman, Washington, D. C.	Drugs.
2974	July 16, 1901	M. Du Perow, Washington, D. C.	Electrical supplies.
2975	July 19, 1901	Mackall Bros., Washington, D. C.	Drugs.
2977	July 11, 1901	American Ice Co., Washington, D. C.	Ice.
2979	July 17, 1901	J. C. Ergood Co., Washington, D. C.	Groceries.
2980	July 18, 1901	Lansburgh & Bro., Washington, D. C.	Dry goods.
2982	July 19, 1901	James B. Lambie, Washington, D. C.	Hardware.
2983	July 20, 1901	S. R. Waters, Washington, D. C.	Groceries.
2984	....do.....	Fred J. White, Washington, D. C.	Miscellaneous castings.
2985	....do.....	National Electric Supply Co., Washington, D. C.	Electrical supplies.
2986	July 22, 1901	Rufus P. Clarke.	Dry goods.
2987	....do.....	Hugh Reilly.	Glass, paints, and varnish.
2989	July 23, 1901	J. Edw. Chapman, Washington, D. C.	Fuel.
2990	....do.....	S. S. Daish & Sons, Washington, D. C.	Fuel and forage.
2994	July 26, 1901	Geo. F. Muth & Co., Washington, D. C.	Hardware, paints, oils, etc.
2995	July 29, 1901	Standard Oil Co., Washington, D. C.	Glass, paints, and varnish.
2996	July 24, 1901	Church & Stephenson, Washington, D. C.	Lumber.
2997	July 27, 1901	Johnson Bros., Washington, D. C.	Fuel.
2998	July 29, 1901	Barber & Ross, Washington, D. C.	Hardware.
2999	....do.....	D. F. Parker, Washington, D. C.	Stationery.
3000	July 31, 1901	Chas. G. Stott & Co., Washington, D. C.	Do.
3002	Aug. 1, 1901	J. M. Dulany, Washington, D. C.	Do.
3003	Aug. 6, 1901	R. C. Ballantyne, Washington, D. C.	Do.
3005	Aug. 7, 1901	Frank Hume, Washington, D. C.	Groceries.
3006	Aug. 9, 1901	Blum Bros., Washington, D. C.	Furniture, hardware, tinware, groceries, and dry goods.
3007	Aug. 14, 1901	W. T. Galliher & Bro., Washington, D. C.	Lumber.
3008	Aug. 8, 1901	G. A. Shehan, Washington, D. C.	Do.
3021	Sept. 3, 1901	Thos. W. Smith, Washington, D. C.	Do.
3022	Sept. 6, 1901	J. M. Dulany, Baltimore, Md.	Schoolbooks.
3024	Aug. 19, 1901	T. T. Keane, Washington, D. C.	Fresh meat and corned beef.
3026	Sept. 9, 1901	Silver, Burdette Co., New York City.	Schoolbooks.
3027	Sept. 16, 1901	R. C. Ballantyne, Washington, D. C.	Do.
3031	Sept. 30, 1901	W. B. Moses & Sons, Washington, D. C.	Furniture, dry goods.
3032	Oct. 1, 1901	American Book Co., New York City.	Schoolbooks.
3036	July 9, 1901	Jordan & Christie, Boston, Mass.	Hardware.
3046	Nov. 11, 1901	B. S. Adams, Washington, D. C.	Miscellaneous printing, etc.

**OPERATIONS OF THE ENGINEER DEPARTMENT, D. C. 187**

*Schedule of proposals for construction of sewer in Eighth street NE., between Hartford and Joliet streets, and in Joliet street between Seventh and Eighth streets, opened June 14, 1902.*

Bidder	Ordinary excavation.	Red-brick masonry in Portland cement.	Vitrified-brick masonry in Portland cement.	Concrete masonry, Portland cement.	Vitrified inverted blocks.	24-inch diameter pipe.	Total cost.
Arthur Cowsill .....	\$0.95	\$13.97	\$19.95	\$8.00	\$0.80	\$1.20	\$5,301.85
W. F. Brenizer Co. ....	.68	13.33	16.67	6.85	.75	.99	4,244.99
Jas. A. Coyle .....	.65	14.00	19.00	7.35	.70	1.10	4,444.50
Lyons Bros .....	.64	13.75	18.50	7.35	.80	1.10	4,481.35

*Schedule of proposals received June 14, 1902, for repair of North Capitol street sewer between I and K streets.*

Bidder.	Ordinary excavation.	Red-brick masonry in Portland cement.	Vitrified-brick masonry, Portland cement.	Concrete masonry, Portland cement.	Total.
Arthur Cowsill .....	\$1.95	\$19.75	\$39.00	\$12.20	\$7,136.25
W. F. Brenizer Co. ....	1.75	18.00	28.00	11.00	5,945.00
Jas. A. Coyle .....	2.50	25.00	45.00	18.00	9,235.00
Lyons Bros .....	2.25	23.00	40.00	17.00	8,470.00

*Schedule of proposals for constructing dead house at Washington Asylum, opened June 16, 1902.*

Bidder.	Amount.	Bidder.	Amount.
Wm. Rothwell .....	\$1,095	D. F. Mockabee .....	\$1,239
Pavarini & Greer .....	1,120	Gleeson & Humphrey .....	1,240
Arthur Cowsill .....	1,158		

*Schedule of bids received for constructing coal and ash pockets in Trumbull street pumping station, opened June 7, 1902.*

Bidder.	Amount.	Bidder.	Amount.
Henri Kampmann .....	\$7,850	Roebing Construction Co. ....	\$18,707
W. B. Upton Co .....	12,500	The Southern Expanded Metal Co.	13,707

<sup>a</sup> Hennebeque system.

*Schedule of proposals for furnishing cast-iron water pipe, opened October 19, 1901.*

Bidder.	Cost per ton.	Bidder.	Cost per ton.
Warren Foundry and Machine Co. ....	\$24.90	M. J. Drummond & Co .....	\$26.90
United States Cast Iron Pipe and Foundry Co. ....	26.40	R. D. Wood & Co .....	25.90

*Schedule of proposals for improving Bunker Hill road, opened March 1, 1902.*

Bidder.	Grading, price.	Unloading macadam, price.	Paving gutters, price.	Setting curb, price.	Relaying sidewalk, price.
M. F. Talty .....	\$0.28	\$0.34	\$ .40	\$0.17	\$0.30
W. F. Brenizer .....	.30	.42	.70	.23	.50
Lyons Bros .....	.29½	.30	.62	.25	.35

# 188 OPERATIONS OF THE ENGINEER DEPARTMENT, D. C.

*Schedule of proposals for 40,000 feet of cast-iron pipe opened February 1, 1902.*

Bidder.	Price per ton.	Cost.
M. J. Drummond & Co., New York, N. Y. ....	\$26.90	\$14,256.00
Camden Iron Works, Camden, N. J. ....	28.98	15,638.40
Warren Foundry and Machine Co., New York, N. Y. ....	29.20	15,784.00
United States Cast Iron Pipe and Foundry Co., Philadelphia, Pa. ....	29.40	15,876.00

*Schedule of proposals for completing the grading of Joliet street, opened March 8, 1902.*

Bidder.	Price.	Amount.	Bidder.	Price.	Amount.
W. L. Swormstedt .....	\$0.29	\$7,250	Pavarini & Greer .....	\$0.40	\$10.00
Geo. B. Mullen .....	.33	8,250	Owen Patterson .....	.45	11.50

*Schedule of proposals for steam generating equipment at Trumbull street pumping station, opened December 14, 1901.*

Crook, Homer & Co., Baltimore, Md.:	
Cahall boilers, Roney stokers, Green economizers. ....	\$48,000
Cahall boilers, Murphy stokers, American economizers. ....	48,000
B. & W. boilers, Roney stokers, Green economizers. ....	50,000
Heine boilers, Roney stokers, Green economizers. ....	46,500
Westinghouse, Church, Kerr & Co., New York, N. Y.:	
Cahall boilers, Roney stokers, Westinghouse economizers. ....	49,785
B. & W. boilers, Roney stokers, Westinghouse economizers. ....	50,964
Harris & Algor, Camden, N. J.:	
National boilers, Wilkinson stokers, American economizers. ....	52,812
National boilers, Wilkinson stokers, Green economizers. ....	53,412
National boilers, Roney stokers, American economizers. ....	53,082
National boilers, Murphy stokers, American economizers. ....	54,612

<sup>a</sup> Heine boilers not acceptable under specifications.

*Schedule of proposals opened November 2, 1901, for furnishing design buildings and erecting a complete water end for the pumping engine.*

Bidder.	Amount.	Bidder.	Amount.
Allis Chalmers Co. ....	\$18,500	Snow Steam Pump Works. ....	\$28.67
Camden Iron Works. ....	28,360	Barr Pumping Engine Co. ....	48,000

*Schedule of bids for furnishing 9,000 barrels Portland cement, opened December 19, 1901.*

Bidder.	Cement house.	Tracks Baltimore and Ohio Railroad.	Tracks Philadelphia, Wilmington and Baltimore Railroad.
Northampton Portland Cement Co. ....	\$1.47	\$1.43	\$1.43
National Mortar Co. ....	1.455	1.485	1.415
Atlas Portland Cement Co. ....	1.51	1.47	1.47
Lehigh Portland Cement Co. ....	1.52	1.48	1.48
Alpha Portland Cement Co. ....	1.55	1.50	1.50
Walter T. Bradley Co. ....	1.62	1.55	1.55
Cranford Paving Co. ....	1.65	1.60	1.60
Reading Cement Co. ....		1.60	
Wm. Wirt Clarke & Son. ....	1.84	1.80	1.80

*Schedule of proposals for grading Connecticut avenue from Columbia road to Wyoming avenue and California avenue from Columbia road westward, opened December 28, 1901.*

Bidder.	Remov- ing cobble, brick, etc.	Remov- ing curb.	Remov- ing as- phalt pave- ment.	Excava- tion.	Total.
Colburn Paving Co.....	\$0.12	\$0.08	\$0.15	\$0.28	\$6.390
Geo. B. Mullin.....	.10	.06	.25	.32	7.296
Carmody & Hough.....	.25	.15	.40	.31	7.545

*Schedule of proposals for constructing a manual training school, Seventh and G streets SE., opened November 30, 1901.*

Bidder.	Red brick, machine- made.	Red brick, hand- made.	Light brick.	Supple- mental.
N. H. Thomas.....	\$15,900.00	-----	-----	\$12,951.00
James F. Oliver.....	17,040.00	\$17,900.00	\$18,300.00	13,748.00
Arthur Cowsill.....	15,762.00	16,157.00	16,919.00	14,790.32

*Schedule of proposals for grading Massachusetts avenue from T street to Observatory circle, opened November 23, 1901.*

Bidder.	Price.	Amount.	Bidder.	Price.	Amount.
Cogan Bros. & Forschner ...	\$0.19 $\frac{1}{2}$	\$49,375	Lane Bros. & Co.....	\$0.32	\$80,000
Talty & Allen.....	.21	52,500	Andrew Gleeson.....	.33 $\frac{1}{2}$	83,750
W. F. Brenizer.....	.27 $\frac{7}{10}$	69,250	Colburn Paving Co.....	.47	117,500
R. A. Malone & Co.....	.28	70,000			

*Schedule of proposals for furnishing and delivering cast-iron water pipe.*

Bidder.	12-inch pipe.	3-inch pipe.	4-inch pipe.	Total.
	<i>Per ton.</i>	<i>Per ton.</i>	<i>Per ton.</i>	
Camden Iron Works.....	\$24.70	\$24.70	\$24.70	\$11,786.84
M. J. Drummond & Co.....	24.60	27.50	26.50	11,791.70
United States Cast Iron Pipe and Foundry Co.....	25.33	29.37	27.37	12,150.04
Warren Foundry and Machine Co.....	25.50	25.50	25.50	12,168.00

*Schedule of proposals for construction of sewers, opened November 2, 1901.*

SEWER A.

[B street SW., between Sixth and Tenth streets.]

Bidder.	Ordinary ex- cavation.	Brick mason- ry, natu- ral cement mortar.	Vitrified brick mason- ry, Port- land cement mortar.	Concrete mason- ry, natu- ral cement mortar.	Concrete mason- ry, Port- land cement mortar.	Total cost.
Warren F. Brenizer.....	\$0.59	\$11.00	\$15.20	\$5.06	\$6.90	\$7,683.10
E. G. Gummel.....	.70	12.50	19.50	5.50	7.00	8,731.50
Lyons Bros.....	.64	11.00	18.00	5.75	6.75	8,208.65

190 OPERATIONS OF THE ENGINEER DEPARTMENT, D. C.

*Schedule of proposals for furnishing and delivering cast-iron water pipe—Cont'd.*

SEWER B.

[Connecticut avenue NW., from Rock Creek to Cathedral avenue.]

Bidder.	Ordinary excavation.	Brick masonry, natural cement mortar.	Vitrified brick masonry, Portland cement mortar.	Concrete masonry, natural cement mortar.	Concrete masonry, Portland cement mortar.	Vitrified invert block.	Total cost.
W. F. Brenizer.....	\$0.58	\$11.00	\$15.20	\$5.08	\$6.90	\$0.70	\$12,722.78
E. G. Gummel.....	.90	12.50	19.50	5.50	7.00	.80	15,842.80
Lyons Bros.....	.75	11.50	18.50	6.00	7.00	.70	14,571.50

SEWER C.

[Across square 830, along Florida avenue NW., between Tenth and Eleventh streets, and along Eleventh street, between Florida avenue and Clifton street.]

Bidder	Ordinary excavation.	Brick masonry, natural cement mortar.	21-inch diameter pipe.	18-inch diameter pipe.	Total cost.
W. F. Brenizer.....	\$0.61	\$11.00	\$0.79	\$0.75	\$2,228.65
E. G. Gummel.....	.90	12.50	.80	.70	2,892.80
Lyons Bros.....	.60	11.00	.74	.64	2,165.30
Jas. A. Coyle.....	.50	11.00	.68	.60	1,904.80

SEWER D.

[O street SW., between Delaware avenue and James Creek Canal.]

Bidder.	Ordinary excavation.	Brick masonry, natural cement mortar.	24-inch diameter pipe.	Total cost.
Warren F. Brenizer.....	\$0.71	\$12.00	\$0.90	\$745.10
E. G. Gummel.....	.75	12.50	.90	725.50
Lyons Bros.....	1.00	15.00	1.50	1,650.00
Jas. A. Coyle.....	.40	11.00	.80	530.00

*Schedule of proposals for constructing a power house and nurses' home at Providence Hospital, opened October 26, 1902.*

Bidder.	Amount.
Brennan Construction Co.....	\$49,651.00
H. E. Burgess.....	75,000.00

*Proposals for grading certain streets and a school site, opened July 27, 1901.*

Bidder.	Third street NE, L to Florida avenue.	School site, square 838.	South Dakota avenue and other streets, Woodridge.
	Per cu. yd.	Per cu. yd.	Per cu. yd.
Hatton & Parker.....	\$0.34	\$0.44	\$1.30
Patrick Keelty.....	.42		
Carmody & Hough.....	.29	.50	.27
Andrew Gleeson.....	.34	.45	.29
L. N. Simpson.....		.48	
M. F. Talty.....	.29	.36	.32
Matthew Myers.....	.35	.35	.31
Killeen & Ball.....	.34		.31
W. F. Brenizer.....	.27		

**OPERATIONS OF THE ENGINEER DEPARTMENT, D. C. 191**

*Proposal for sewage-pumping plant, opened July 13, 1901.*

Name and address of bidder.	Equip- ment A. regular.	Complete equip- ment.		Equip- ment B. regular.	Partial equip- ment, alter- nate.
		Alter- nate, No. 1.	Alter- nate, No. 2.		
Allis-Chalmers Co., Milwaukee, Wis. ....	\$253,000	\$231,000	\$241,000	\$158,750	\$146,000
United Engineering and Contracting Co., New York City.....	829,450	.....	.....	230,875	.....
Camden Iron Works, Philadelphia, Pa. ....	823,000	.....	.....	212,000	.....

*Proposals for grading and regulating suburban streets and avenues, opened  
July 27, 1901.*

Bidder.	Grading (per cu- bic yard).	Setting 6 by 20 curb (per linear foot).	Paving gutters (per square yard).	Unload- ing mac- adam (per cu- bic yard).	Over- hauling macad- am (per cubic yard).	Total.
Carmody & Hough.....	\$0.27	\$0.15	\$0.23	\$0.29	\$0.06	\$8,237.10
M. F. Talty.....	.30	.20	.25	.37	.22	10,150.10

*Schedules of bids received July 20, 1901, for repairs and changes in plumbing in  
Addison and Curtis school buildings.*

Bidder	Amount.
E. J. Hannan.....	\$15,740
S. S. Shedd & Bro.....	15,888
Jas. Nolan & Sons.....	13,324

*Schedule of bids received for changing plumbing in teachers' toilet room of  
Peabody School, opened June 18, 1901.*

Bidder.	Amount.
Jas. Nolan & Sons.....	\$298
Kennedy & Schaefer.....	307
M. B. Casey.....	180

*Schedule of proposals for construction of a rubble wall along the east side of  
Garfield Hospital grounds, opened July 13, 1901.*

Bidder.	Amount.	Bidder.	Amount.
Lyons Bros.....	\$1,187.00	Jos. Robeson.....	\$1,200
Cranford Paving Co.....	1,169.25	Killeen & Ball.....	1,675

*Schedule of proposals received for reconstruction of plumbing in the Mott School  
building, opened June 29, 1901.*

Bidder.	Amount.
Jas. Nolan & Sons.....	\$5,799
Wm. Rathwell.....	5,789
S. S. Shedd & Bro.....	5,237

# 192 OPERATIONS OF THE ENGINEER DEPARTMENT, D. C.

*Schedule of proposals for excavating for foundation of new pumping station, opened June 30, 1901.*

Bidder.	Price per cubic yard.
Andrew Gleeson.....	\$0.91
Carmody & Hough.....	.28
J. H. Hammersly.....	.50

*Schedule of proposals for constructing an eight-room school building on lots 2 to 10, square 615, P street NW., between North Capitol street and First street, opened August 3, 1901.*

Bidders.	Red brick.	Brick other than red, \$25 per M.	Brick other than red, \$30 per M.	Supplemental bid.
Gleeson & Humphrey.....	\$42,800.00	\$43,100.00		\$33,185.00
J. M. Dunn.....	43,800.00	45,080.00	\$45,580.00	
Meads & Reynolds.....	44,000.00	44,950.00	45,000.00	
Arthur Cowdill.....	51,605.00	52,605.00	66,045.00	

*Schedule of proposals for constructing a four-room school building on lots 18, 19, 20, and part of 21, block 26, Petworth, Philadelphia street, between Eighth street and Brightwood avenue NW., opened August 3, 1901.*

Bidder.	Red brick.	Brick, other than red, \$25 per M.	Brick, other than red, \$30 per M.	Supplemental bid.
Gleeson & Humphrey.....	\$25,500	\$26,000		\$20.00
Meads & Reynolds.....	26,800	27,500	\$28,000	

*Proposals for the completion of plumbing in Birney School, Nichols avenue, Anacostia, opened August 2, 1901.*

Bidder.	Amount.	Bidder.	Amount.
Wm. Rathwell.....	\$1,038	S. S. Shedd & Bro.....	\$1.08
Jas. Nolan & Sons.....	1,461	M. B. Casey.....	1.08

*Schedule of proposals for crushing stone in Rock Creek Park, opened August 3, 1901.*

Bidder.	Price per cubic yard.	Bidder.	Price per cubic yard.
Lyons Bros.....	\$0.98	Killien & Ball.....	\$1.5
G. B. Mullin.....	1.34	Cranford Paving Co.....	1.6

*Schedule of proposals for laying cement sidewalks in the District of Columbia, opened August 10, 1901.*

Bidder.	Class A.	Class B.	Total amount.
Cranford Paving Co.....	\$0.89	\$1.07	\$45,760.00
Brennan Construction Co.....	.92	1.11	47,330.00
E. G. Gunmel.....	.94	1.08	47,920.00
F. M. Kemp & Sons.....	.98	1.08	49,700.00
Colburn Paving Co.....	.97	1.21	50,120.00
R. A. Malone & Co.....	1.15	1.20	57,600.00
Franklin Construction Co.....	1.18	1.28	59,700.00

**OPERATIONS OF THE ENGINEER DEPARTMENT, D. C. 193**

*Schedule of proposals for granolithic work about Webb and Dent schools, opened August 16, 1901.*

Bidder.	Webb School.	Dent School.
Cranford Paving Co .....	\$385.55	\$355.65
Brennan Construction Co .....	893.28	887.52

*Schedule of proposals for constructing a school building at Lincoln avenue and Prospect street NE.*

Bidder.	Red brick, machine made.	Red brick, hand made.	Light brick.	Supplemental bid.
J. M. Dunn .....	\$45,800	\$45,900	\$46,950	
Pavarini & Greer .....	48,600	48,860	49,500	\$500 to be deducted, 1, 2, and 3.
Arthur Cowsill .....	48,400	48,555	49,472	
Gleeson & Humphrey .....	50,500	50,700	52,000	\$1,900 to be deducted, 1, 2, and 3.
Meads & Reynolds .....	53	51,883	52,863	\$50,800.
D. F. Mockabee .....	53,391	53,891	55,041	\$52,738.

*Schedule of proposals for toilet building and plumbing, Old Men's Home, Washington Asylum, opened August 24, 1901.*

Bidder.	Amount.
E. J. Hannan .....	\$1,475
Wm. Rothwell .....	1,499
Jas. Nolan & Sons .....	1,736

*Schedule of proposals for steel arched ribs for Melan arch bridge across Rock Creek, on line of Rock Creek drive, opened August 31, 1901.*

Name and address of bidder.	Amount.	Name and address of bidder.	Amount.
Penn. Bridge Co., Beaver Falls, Pa. ....	\$339	American Bridge Co., Baltimore, Md .....	\$1,068
New Jersey Foundry and Machine Co., New York City .....	991	Jas. C. McGuire, New York City .....	1,185

*Schedule of proposals for Melan arch bridge across Rock Creek, on line of Rock Creek drive, opened August 31, 1901.*

Name and address of bidder.	Amount.	Name and address of bidder.	Amount.
Talty & Allen, Washington, D. C. ....	\$14,890	W. B. Upton & Co., Washington, D. C. ....	\$23,900
J. C. McGuire, New York City .....	18,000		
Cranford Paving Co., Washington, D. C. ....	19,599		

*Schedules of proposals for constructing stable for fire department on rear of lot 10, block 872, North Carolina avenue, between Sixth and Seventh streets SE., opened September 7, 1901.*

Bidder.	Amount.
Pavarini & Greer .....	\$4,700
Burgess & Parsons .....	4,774

# 194 OPERATIONS OF THE ENGINEER DEPARTMENT, D. C.

*Proposals for improving Connecticut avenue west of Rock Creek, opened September 7, 1901.*

Bidder.	Grading below present surface.	Grading above present surface.	Macadam removed and re- placed.
	<i>Per cu. yd.</i>	<i>Per cu. yd.</i>	<i>Per cu. yd.</i>
G. B. Mullin.....	\$0.77	\$0.88	\$0.50
Lyons Bros.....	.88	.48	.65
Coogan Bros. & Forschner.....	1.00	.68	.80

*Schedule of proposals for furnishing and erecting boiler at male workhouse, Washington Asylum, opened September 10, 1901.*

Bidder.	Amount.	Bidder.	Amount.
W. H. McCuen & Co.....	\$914	Ellicott Machine Co.....	\$1,240
National Electrical Supply Co.....	944	W. W. Biggs Heating and Venti- lating Co.....	1,385
Forsberg & Murray.....	976		

*Schedule of proposals for furnishing and erecting fences around Dent and Webb schools.*

Bidder.	Dent School.	Webb School.
J. W. Swainson.....	\$526.00	\$220.00
Brennan Construction Co.....	762.00	300.00
J. M. Dunn.....	678.75	275.00

*Schedule of proposals for new boiler house, etc., for Jefferson School building, Sixth and D streets SW.*

Bidder.	Amount.
W. E. Mooney.....	\$4,513
J. F. Leary.....	4,997
Pavarini & Greer.....	6,800

*Schedule of proposals for furnishing and erecting two steam boilers, etc., at Custis School building, O street NW., between Thirty-second and Thirty-third streets, opened September 25, 1901.*

Bidder.	Amount.
National Electrical Supply Co.....	\$2,858.3
Ellicott Machine Co.....	4,890.00

*Schedule of proposals for constructing stable in rear of truck house on Whitney avenue, between Thirteenth and Fourteenth streets NW., opened September 21, 1901.*

Bidder.	Amount.
J. F. Leary.....	\$1,897
Pavarini & Greer.....	1,800

OPERATIONS OF THE ENGINEER DEPARTMENT, D. C. 195

*Schedule of bids received September 21, 1901, for pumping-station building, Trumbull street.*

Name and address of bidder.	Brick facing.						
	Granite base, Beaver Dam marble.	Granite base, South Dover marble.	Granite base, Indiana limestone.	All stone granite.	Granite base, Vermont "D" marble.	Granite base, Vermont "A" marble.	Granite base, Vermont "B" marble.
E. M. Noel, Baltimore, Md.	\$208,000.00	\$312,000.00	\$290,000.00	\$325,000.00			
Geo. A. Fuller Co., Baltimore, Md.	305,282.00				\$314,282.00	\$326,282.00	\$320,282.00
Arthur Cowsill, Washington, D. C.	344,200.00	340,000.00	332,000.00		\$354,000.00		
Richardson & Burgess, Washington, D. C.	342,935.00						
R. A. Malone & Son, Washington, D. C.	377,800.00						
W. E. Speir, Washington, D. C.	366,165.00						
Penn Bridge Co., Beaverfalls, Pa.		317,700.00	310,700.00		\$336,355.00	\$347,355.00	\$347,355.00
Cramp & Co., Philadelphia, Pa.	335,000.00						349,000.00
P. J. Carlin & Co., Brooklyn, N. Y.	325,500.00	319,593.00	304,900.00				

Name and address of bidder.	Brick facing.					
	Granite base, Georgia marble.	Granite base, Lee marble.	Granite base, Vermont marble.	Granite base, Columbian marble.	Granite base, Vermont "C" marble.	Granite base, Tennessee white marble.
E. M. Noel, Baltimore, Md.						
Geo. A. Fuller Co., Baltimore, Md.						
Arthur Cowsill, Washington, D. C.					\$354,000.00	
Richardson & Burgess, Washington, D. C.		\$342,935.00				
R. A. Malone & Son, Washington, D. C.	\$379,800.00	374,800.00	\$375,800.00			
W. E. Speir, Washington, D. C.	368,165.00	363,165.00	364,165.00			
Penn Bridge Co., Beaverfalls, Pa.				\$336,355.00	336,355.00	
Cramp & Co., Philadelphia, Pa.					342,000.00	\$332,000.00
P. J. Carlin & Co., Brooklyn, N. Y.		323,500.00	325,500.00			

Name and address of bidder.	Ashlar masonry facing.						
	Granite base, Beaver Dam marble.	Granite base, Indiana limestone.	Granite base, South Dover marble.	All granite.	Columbian marble and granite base.	Granite base, Georgia marble.	Granite base, Lee marble.
E. M. Noel, Baltimore, Md.	\$336,000.00	\$320,000.00	\$360,000.00	\$375,000.00			
Geo. A. Fuller Co., Baltimore, Md.	\$345,282.00						
Arthur Cowsill, Washington, D. C.	380,000.00		376,000.00		\$378,000.00		
Richardson & Burgess, Washington, D. C.	388,379.00						
R. A. Malone & Son, Washington, D. C.	426,750.00					\$441,400.00	\$428,400.00
W. E. Speir, Washington, D. C.	473,050.00					436,050.00	424,050.00
Penn Bridge Co., Beaverfalls, Pa.			397,700.00		440,000.00		
Cramp & Co., Philadelphia, Pa.	379,000.00						
P. J. Carlin & Co., Brooklyn, N. Y.	390,000.00	357,500.00	396,600.00				

<sup>a</sup>No. 2 marble.

<sup>b</sup>"D," "C," or "E" marble.

<sup>c</sup>Or Lee.

<sup>d</sup>No. 1 limestone.

<sup>e</sup>Or Tennessee white marble.

# 196 OPERATIONS OF THE ENGINEER DEPARTMENT, D. C.

*Schedule of bids received September 21, 1901, for pumping-station building, Trumbull street—Continued.*

Name and address of bidder.	Ashlar masonry facing.					
	Granite base, Vermont marble.	Granite base, Vermont "B" marble.	Granite base, Vermont "C" or "E" marble.	Granite base, Vermont "D" marble.	Granite base, Vermont "A" marble.	Granite base, Tennessee white marble.
E. M. Noel, Baltimore, Md.						
Geo. A. Fuller Co., Baltimore, Md.					\$305,282.00	\$345,282.00
Arthur Cowsill, Washington, D. C.						
Richardson & Burgees, Washington, D. C.						
R. A. Malone & Son, Washington, D. C.	\$427,000.00					
W. E. Speir, Washington, D. C.	423,050.00					
Penn Bridge Co., Beaverfalls, Pa.		\$447,000.00	\$435,000.00	\$424,700.00	452,300.00	
Cramp & Co., Philadelphia, Pa.		438,000.00	415,000.00			384,000.00
P. J. Carlin & Co., Brooklyn, N. Y.				384,000.00		

"Vermont "C."

*Schedule of proposals for furnishing and erecting complete steam boilers at the manual training school No. 2, P street NW., between First and Third.*

Bidder.	Amount.
Heine Safety Boiler Co .....	\$5,316
Forsberg & Murray (complete) .....	5,575
Hawley Down Draft Furnace Co .....	1,300

*Schedule of proposals for water gates for Trumbull street pumping station, received October 5, 1901.*

Bidder.	Four 30-inch.	One 30-inch.	Seven 36-inch.	Three 36-inch.	Three 42-inch.	Three 48-inch.	Total.
Michigan Brass and Iron Works .....	\$6,000	\$1,290	\$12,845	\$4,500	\$5,250	\$6,300	\$36,185
Coffin Valve Co. ....	6,180	7,315	13,125	4,686	5,430	6,300	37,036
Rennselaer Manufacturing Co. ....	6,208	1,345	13,300	4,830	5,619	6,900	38,202
Ludlow Valve Co. ....	6,420	1,375	13,475	4,875	5,580	6,630	38,355
Chapman Valve Manufacturing Co. ....	6,700	1,410	14,035	4,875	5,535	6,975	39,530
Eddy Valve Co. ....	6,780	1,450	14,350	4,770	5,790	6,525	39,615

Bidder.	Ordinary excavation.	Brick masonry, Portland cement.	Vitrified brick masonry, Portland-cement mortar.	Concrete masonry A.	Concrete masonry B.	6-inch pipe under-drain.	Total cost.
	22,600 cu. yds.	150 cu. yds.	170 cu. yds.	550 cu. yds.	415 cu. yds.	3,000 lin. ft.	
E. G. Gummel .....	\$1.20	\$16.00	\$25.00	\$8.50	\$8.00	\$0.20	\$42,365.00
John Jacoby .....	1.50	12.00	22.00	7.75	7.75	.25	47,668.75
	22,600 cu. yds.	710 cu. yds.	170 cu. yds.	550 cu. yds.	415 cu. yds.	3,000 lin. ft.	
E. G. Gummel .....	\$1.20	\$16.00	\$25.00		\$8.00	\$0.20	46,650.00
John Jacoby .....	1.50	12.00	22.00		7.75	.25	50,135.25

OPERATIONS OF THE ENGINEER DEPARTMENT, D. C. 197

*Schedule of proposals for concrete floors, manual training school, Seventh street and Rhode Island avenue NW., opened September 28, 1901.*

Bidder.	Amount.	Bidder.	Amount.
M. B. Upton & Co.....	\$1,548	Cranford Paving Co.....	\$1,300
Lyons Bros.....	1,545	Colburn Paving Co.....	1,237

*Schedule of proposals for constructing foundations for masonry bridge across Rock Creek, on line of Connecticut avenue, opened October 12, 1901.*

Bidder.	Exca- vation.	Con- crete foun- da- tions.	Total amount.	Bidder.	Exca- vation.	Con- crete foun- da- tions.	Total amount.
Lyons Bros.....	\$0.59	\$5.87	\$29,991.00	James C. McGuire...	\$0.535	\$5.61	\$28,143.00
Brennan Construc- tion Co.....	.58	5.07	27,171.00	Cranford Paving Co.	.80	5.00	30,900.00

*Schedule of proposals for constructing a power house and nurses' home for Providence Hospital.*

Bidder.	Amount.
Brennan Construction Co.....	\$49,850.00
H. E. Burgess.....	75,000.00

*Schedule of proposals for furnishing cast-iron water pipe received June 7, 1902.*

Bidders.	Amount.
United States Cast Iron Pipe and Foundry Co.....	\$18,700.00
Camden Iron Works.....	25,000.00

*Schedule of proposals for furnishing and erecting electric crane for Trumbull street pumping station, opened May 24, 1902.*

Name and address of bidder.	Amount.	Name and address of bidder.	Amount.
New Jersey Foundry and Machine Co., New York.....	\$5,510.00	Niles-Bement-Pond Co., Philadel- phia, Pa.....	\$5,100.00
Alliance Machine Co., Alliance, Ohio.....	5,975.00	Powling & Harnishfegen, Milwau- kee, Wis.....	5,000.00
Edw. J. Etting, Philadelphia, Pa.....	5,290.00		

*Proposals for improving Bunker Hill road, opened March 1, 1902.*

Bidder.	Grading.	Unload- ing mac- adam.	Paving gutters.	Setting curb.	Relay- ing side- walk.	Total.
M. F. Talty.....	\$0.28	\$0.34	\$0.40	\$0.17	\$0.30	\$5,322.00
W. F. Benizer.....	.30	.42	.70	.23	.50	7,682.00
Lyons Bros.....	.29½	.30	.62	.25	.35	7,263.00

# 194 OPERATIONS OF THE ENGINEER DEPARTMENT, D. C.

*Proposals for improving Connecticut avenue west of Rock Creek, opened September 7, 1901.*

Bidder.	Grading below present surface.	Grading above present surface.	Macadam removed and re- placed.
	<i>Per cu. yd.</i>	<i>Per cu. yd.</i>	<i>Per cu. yd.</i>
G. B. Mullin.....	\$0.77	\$0.83	\$1.3
Lyons Bros.....	.89	.43	.6
Coogan Bros. & Forscher.....	1.00	.63	.9

*Schedule of proposals for furnishing and erecting boiler at male workhouse, Washington Asylum, opened September 10, 1901.*

Bidder.	Amount.	Bidder.	Amount.
W. H. McCuen & Co.....	\$914	Ellicott Machine Co.....	\$1.39
National Electrical Supply Co.....	944	W. W. Biggs Heating and Venti- lating Co.....	1.35
Forsberg & Murray.....	976		

*Schedule of proposals for furnishing and erecting fences around Dent and Webb schools.*

Bidder.	Dent School.	Webb School.
J. W. Swainson.....	\$523.00	\$223.0
Brennan Construction Co.....	762.00	222.0
J. M. Dunn.....	678.75	225.0

*Schedule of proposals for new boiler house, etc., for Jefferson School building, Sixth and D streets SW.*

Bidder.	Amount.
W. E. Mooney.....	\$4.33
J. F. Leary.....	4.35
Pavarini & Greer.....	6.39

*Schedule of proposals for furnishing and erecting two steam boilers, etc., at Custis School building, O street NW., between Thirty-second and Thirty-third streets, opened September 25, 1901.*

Bidder.	Amount.
National Electrical Supply Co.....	\$2,322.5
Ellicott Machine Co.....	4,592.0

*Schedule of proposals for constructing stable in rear of truck house on Whitney avenue, between Thirteenth and Fourteenth streets NW., opened September 21, 1901.*

Bidder.	Amount.
J. F. Leary.....	\$1.35
Pavarini & Greer.....	1.39

OPERATIONS OF THE ENGINEER DEPARTMENT, D. C. 199

*Schedule of proposals for construction of sewers, opened May 17, 1902—Incompleted work of John Jacoby.*

[Sec. B, east side intercepting sewer.]

Bidder.	Ordinary excavation.	Brick masonry, natural cement mortar.	Vitrified brick masonry, Portland cement.	Concrete masonry, natural cement.	Total cost.
Andrew Gleeson.....	\$0.79	\$0.00	\$18.00	\$5.00	\$84,628.00
B. J. Sullivan.....	1.00	12.00	20.00	7.00	108,320.00
M. F. Talty.....	1.00	12.00	20.00	5.00	106,868.00
J. Jacoby's prices.....	.50	9.00	16.00	5.00	68,140.00

*Schedule of proposals for construction of sewers opened May 17, 1902—Incompleted work of John Jacoby.*

[Boundary sewer between Seventeenth and E streets NE. and Twenty-first and A streets NE.]

Bidder.	Ordinary excavations.	Embankment over sewer.	Brick masonry, natural cement mortar.	Red-brick masonry, Portland cement mortar.	Vitrified brick masonry, Portland cement mortar.	Concrete masonry, natural cement mortar.	Red-brick arch, natural cement mortar.	Total cost.
Andrew Gleeson.....	\$0.39	\$0.18	\$9.15	\$10.40	\$18.00	\$4.95	\$9.15	\$147,796.90
B. J. Sullivan.....	.41	.18	12.50	10.10	18.00	5.00	5.50	149,285.00
Owen Patterson.....	.45	.25	12.75	13.00	18.00	7.25	12.75	200,141.50
Arthur Cowsill.....	.53	.21	9.00	10.50	15.00	3.00	8.73	135,387.78
W. B. Upton.....	.55	.20	9.30	11.25	17.90	4.81	9.30	147,986.80
J. Jacoby's prices.....	.30	.18	8.50	10.00	18.00	4.20	8.50	134,236.00

*Schedule of bids received June 3, 1902, for sewer bricks.*

Bidder.	Washington.	Georgetown.	County east of Eastern Branch.	Between Eastern Branch and Rock Creek.	West of Rock Creek.	Delaware avenue and H street NE.	Pennsylvania R. R.	Baltimore and Ohio R. R.	District of Columbia yards.	Bidder's works.	Hauling.
Frederick Brick Works..	.....	.....	.....	.....	.....	\$9.70	.....	.....	.....	.....	.....
Wm. Wirt Clarke & Son.	.....	.....	.....	.....	.....	.....	\$13.00	\$13.00	.....	.....	.....
John Miller & Co.....	\$9.41	\$10.41	\$10.41	\$10.41	\$8.91	.....	.....	.....	\$8.00	\$9.00	\$0.50
Standard Brick Company	9.39	9.89	9.90	10.19	11.39	.....	.....	.....	9.69	8.39	.89

<sup>a</sup> For city delivery, Third and O street SW.

<sup>b</sup> Waterloo Station, Va.

## 198 OPERATIONS OF THE ENGINEER DEPARTMENT, D. C.

*Schedule of proposals for two switchboards for Trumbull street pumping station, opened April 5, 1902.*

Bidder.	Amount.	Bidder.	Amount.
General Electric Co .....	\$2,847.00	Western Electric Co .....	\$2,917.00
Doa .....	2,300.00	McCay Engineering Co .....	2,930.00
D'Ober Engineering Co .....	2,845.00	Johnson & Morton .....	2,415.00
F. A. LaRoche Co .....	2,825.00	National Electric Supply Co .....	3,047.00

<sup>a</sup> Alternative bid.

*Schedule of bids for constructing cofferdam at sewerage pumping station, opened April 5, 1902.*

Bidder.	Piling.	Lumber.	Clay and gravel filling.	Total cost.
Andrew Gleeson .....	\$0.29	\$38.00	\$0.89	\$5,195.00
Washington Construction Co .....	.30	50.00	1.00	7,450.00
Warren F. Brenizen .....	.20	34.90	.90	5,341.00
Sanford & Brooks Co .....	.19	35.50	1.00	5,430.00
E. G. Gummel .....	.36	50.00	2.00	8,840.00

*Schedule of proposals for construction of cofferdam, façade walls, outlet section of sewer and tide-gate chambers and storm-water conduits at the sewerage pumping station, opened April 5, 1902.*

Bidder.	Ordinary excavation.	Red brick masonry, Portland cement.	Vitrified brick masonry, Portland cement.	Six-inch diameter pipe.	Concrete masonry "A" in place.	Concrete masonry "B" in place.	Concrete masonry "C" in place.	Piling.	Lumber.	Brass pipes for tide-gate hinge bolts, etc.	Steel I beams.	Cast-iron bed plates.	Cast-iron frames and covers in place over tide-gate walls.	Cast-iron frames and covers in place over stop-plank walls.	Granite coping in place.
Andrew Gleeson .....	\$0.97	\$10.50	\$18.00	\$0.15	\$8.90	\$6.50	\$6.25	\$0.28	\$39.00	\$0.75	\$0.045	\$0.04	\$65.00	\$65.00	\$3.50
Washington Construction Co .....	.80	10.30	17.50	.15	8.00	7.00	6.00	.25	38.00	1.00	.045	.04	60.00	70.00	6.75
Warren F. Brenizen .....	.90	12.75	18.20	.15	7.95	7.20	6.10	.18	33.50	1.00	.037	.025	25.00	28.00	3.90
Sanford & Brooks Co .....	.75	10.00	17.75	.20	8.25	7.50	6.75	.19	37.50	1.00	.04	.04	60.00	65.00	6.50
E. G. Gummel .....	1.00	13.00	22.00	.30	10.00	9.00	8.00	.36	47.00	3.00	.0475	.05	75.00	75.00	3.00

*Schedule of proposals for construction of sewers opened May 17, 1902—Incomplete work of John Jacoby.*

[Through grounds W. D. Davidge and Trinity College.]

Bidder.	Ordinary excavation.	Brick masonry, natural cement mortar.	Vitrified brick masonry, Portland cement mortar.	Concrete masonry, natural cement mortar.	Concrete masonry, Portland cement mortar.	Total cost.
Andrew Gleeson .....	\$0.50	\$12.00	\$19.00	\$5.30	\$6.50	\$11,605.70
A. T. Cavan & Co .....	.47	10.50	17.50	5.10	6.90	11,100.05
W. B. Upton Co .....	.55	10.22	19.70	5.38	7.81	12,403.02
M. F. Talty .....	.50	11.00	18.00	5.00	6.50	11,175.00
J. Jacoby's prices .....	.36	10.50	19.00	5.00	6.50	10,530.00

OPERATIONS OF THE ENGINEER DEPARTMENT, D. C. 201

*Schedule of proposals for furnishing Portland cement, opened June 3, 1902.*

Bidder.	Canal street.	Baltimore and Ohio R. R.	Philadel-phia, Wil-mington and Balti-more R. R.
Barber & Ross.....	\$2.80	\$2.25	\$2.25
Wm. Wirt Clarke.....	1.94	1.89	1.89
National Mortar Co.....	1.98	1.98	1.90

*Schedule of proposals received June 20, 1902, for a portion of low-area trunk sewer.*

Bidder.	Ordinary excavation.	Red-brick masonry, Portland cement.	Vitrified-brick masonry, Portland cement.	Concrete masonry, "A" Portland cement.	Concrete masonry, "B" Portland cement.	6-inch diameter pipe.	Total cost.
Arthur Cowsill.....	\$1.17	\$12.00	\$17.50	\$7.50	\$7.10	\$0.15	\$18,194.00
Andrew Gleeson.....	2.80	19.00	27.00	15.00	12.00	.18	27,532.00
M. F. Talty.....	2.50	20.00	25.00	18.50	10.50	.35	25,520.00

# 200 OPERATIONS OF THE ENGINEER DEPARTMENT, D. C.

*Schedule of proposals for furnishing granite curbing, received June 3, 1902.*

Bidder.	Standard, 6 by 20 inches.		Standard, 8 by 8 inches.	
	Straight.	Circular.	Straight.	Circular.
Francis Jones & Co.....	\$0.77	\$1.15	\$0.67½	\$1.10
Georgia Rough and Cut Stone Co.....	.79½	1.25	.71½	1.00
Venable Bros.....	.75	1.00	.66	1.00
Brantley & Doby.....	.78	1.10	.74	1.00

*Schedule of proposals received for sand and gravel, opened June 3, 1902.*

Bidder.	Paving and concrete.	Building.	Screened gravel.
L. E. Smoot.....	\$0.50	\$0.68	\$5.5
Columbia National Sand Dredging Company.....	.55	.65	.90

*Schedule of bids received June 3, 1902, for terra-cotta pipes, Y branches, vitrified invert blocks, and bricks.*

Bidder.	Sewer pipe.							
	24 inches.	21 inches.	18 inches.	15 inches.	12 inches.	10 inches.	8 inches.	6 inches.
Angus Lamond.....					\$0.39		\$0.145	\$0.085
American Sewer Brick Co.....	\$1.05	\$0.81	\$0.55	\$0.44	.33	\$0.25	.165	.085
Federal Clay Manufacturing Co.....	1.04	.80	.54	.43	.32	.24	.16	.08
Pot Works.....	.80	.62	.42	.33	.235	.185	.12	.075
Mack Manufacturing Co.....								

Bidder.	Y branches.							Bands.	Invert bricks.
	24 by 6 inches.	21 by 6 inches.	18 by 6 inches.	15 by 6 inches.	12 by 6 inches.	10 by 6 inches.	8 by 6 inches.		
Angus Lamond.....								\$0.30	\$0.50
Savage Fire Brick Co.....									\$18.30
Guise Brick and Stone Co.....									17.00
American Sewer Brick Co.....	\$4.75	\$3.75	\$2.55	\$2.00	\$1.45	\$1.12	\$0.75	\$0.68	.39
Federal Clay Manufacturing Co.....	4.68	3.60	2.45	1.95	1.50	1.09	.72	.64	.35
Pot Works.....	3.65	2.81	1.91	1.52	1.12	.83	.56	.50	.27
Mack Manufacturing Co.....									

α Clearfield.

*Schedule of proposals received June 3, 1902, for repressed vitrified paving blocks.*

Bidder.	Blocks.	Half blocks.	Remarks.
Mack Manufacturing Co.....	\$20.45	\$12.95	42 to square yard, not less than 50,000.
Jos. P. Mack.....	19.52	12.90	43 to square yard, not less than 50,000.
Guise Brick and Stone Co.....	20.50	15.00	44 to square yard, not less than 200,000.
American Sewer Pipe Co.....	21.70	14.00	42 to square yard, not less than 100,000.

OPERATIONS OF THE ENGINEER DEPARTMENT, D. C. 201

*Schedule of proposals for furnishing Portland cement, opened June 3, 1902.*

Bidder.	Canal street.	Baltimore and Ohio R. R.	Philadel- phia, Wil- mington and Balti- more R.R.
Barber & Ross.....	\$2.80	\$2.25	\$2.25
Wm. Wirt Clarke.....	1.94	1.89	1.89
National Mortar Co.....	1.98	1.96	1.90

*Schedule of proposals received June 20, 1902, for a portion of low-area trunk sewer.*

Bidder.	Ordinary excava- tion.	Red-brick masonry, Portland cement.	Vitrified- brick masonry, Portland cement.	Concrete masonry, "A" Portland cement.	Concrete masonry, "B" Portland cement.	6-inch diameter pipe.	Total cost.
Arthur Cowsill.....	\$1.17	\$12.00	\$17.50	\$7.50	\$7.10	\$0.15	\$18,184.00
Andrew Gleeson.....	2.80	19.00	27.00	15.00	12.00	.18	27,532.00
M. F. Talty.....	2.50	20.00	25.00	13.50	10.50	.36	25,520.00



# INDEX.

	Page.
Report of Engineer Commissioner .....	1
Alleys:	
Paved under permit system .....	56
Paved under assessment system .....	66
Asphalt and cements:	
Report of inspector of .....	164
Asphaltic surface mixture .....	165, 170
Assessment work:	
Sewers .....	115-126
Sidewalks, curbs, and alleys in city .....	66
Sidewalks, curbs, and alleys in county .....	66
Basins and connections, flushing of .....	115
Bridges:	
Report of engineer of .....	88
Care of .....	88
Construction and repair of .....	88
Buildings and building inspection:	
Report of inspector of buildings .....	149
Permits issued and receipts .....	150
School buildings .....	153
Improvements in different sections .....	150
Report of inspector of elevators .....	157
Cements:	
Report of inspector of asphalt and cements .....	164
Tests of natural and Portland cements .....	164
Proposals to furnish .....	188
Chief clerk:	
Engineer department, report of .....	183
Water department, report of .....	111
Computing engineer, report of, and accompanying tables .....	2
Table A.—Street railways in the District of Columbia, July 1, 1902 .....	5
B.—Statement of character and extent of street pavements, July 1, 1902 .....	5
C.—Statement of mileage of street pavements, July 1, 1902 .....	5
D.—Descriptive list of street pavements, giving character, extent, cost, etc. ....	6
E.—Schedule of work on streets and avenues and county roads and suburban streets .....	52
F.—Repairs to asphalt and concrete pavements for year ended June 30, 1902 .....	52
G.—Work done at cost of railroad companies .....	53
H.—Work done by day labor under appropriation for "Current repairs to streets, avenues, and alleys" .....	54
I.—Regular permit work .....	56
K.—Assessment work .....	66
L.—Replacing and repairing sidewalks and curbs around public reservations .....	82
M.—Miscellaneous work .....	84
N.—Whole cost work .....	85
O.—Repairs to cuts by plumbers and others .....	85
P.—Grading streets, alleys, and roads .....	86
Conduits, electric, laid .....	145

	Page.
Contracts:	
For streets and roads, 1902 .....	184
For sewers .....	184
For construction materials .....	184
For construction, hauling, miscellaneous .....	185
For supplies .....	186
Electric conduits laid .....	145, 146
Elevators, report of the inspector of .....	157
Employees:	
Temporary, first division .....	4
Temporary, second division .....	110, 144, 149, 178
On bridges and roads .....	4
In sewer and property divisions and engineer stables .....	110, 144, 149, 178
Engineer of bridges, report of .....	84
Flushing basins and connections .....	115
Harding, Capt. Chester, report of .....	99
Highway-extension plans, report of Assistant Engineer W. P. Richards .....	171
Materials:	
Report of superintendent of property .....	177
Construction, kind and cost of .....	177
Contracts for furnishing .....	184
Meters, water .....	113
Miscellaneous work:	
Streets .....	84
Sewers .....	140
Newcomer, Capt. H. C., report of .....	1
Parking commission, report of superintendent of .....	93
Pavements:	
Granite block .....	5
Vitrified brick .....	5
Asphalt block .....	5
Adjacent to railway tracks .....	53
Report of computing engineer—	
Concrete, repairs to .....	2
Laid at cost of street railways .....	53
Character and area of .....	52
Mileage of .....	5
Report of superintendent of streets .....	4
Repairs to plumbers' cuts .....	85
Proposals for .....	184
Permits:	
Report of permit clerk .....	181
List of, issued during year .....	181
Permit work:	
Sidewalks, alleys, and curbs in city .....	56
Sidewalks, alleys, and curbs in county .....	66
Plumbers:	
Cuts in pavements, repair of .....	85
Charges against, for cuts in pavements, etc .....	85
Plumbing:	
Report of inspector of .....	147
Plumbing in public schools .....	148
Prosecutions .....	161
Plumbing board, report of .....	149
Property:	
Report of superintendent of .....	177
(See also Materials.)	
Proposals received during year for—	
Bricks .....	199-200
Bridges .....	193, 197
Buildings .....	187, 189, 192, 193, 194, 195, 196
Cement sidewalks, laying of .....	192
Cement .....	188, 211
Curb .....	200
Grading and regulating streets and roads .....	187, 189, 190, 191, 194, 197
Paving blocks and bricks .....	200
Pipe, cast-iron water .....	187, 188, 189
Plumbing, repairs, and changes in schools .....	185, 191

	Page.
Proposals received during year for—	
Sand and pebbles.....	200
Sewers .....	187, 189, 198, 199, 201
Sewer materials .....	184
Terra-cotta material .....	184, 200
Pumping stations.....	99
Railways, street, mileage of, in District of Columbia .....	5
Repairs:	
Streets, avenues, and alleys.....	54
Plumbers' cuts .....	85
Roads and suburban streets .....	56
Replacing sidewalks and curbs around reservations .....	82
Roads:	
Report of computing engineer .....	2
Report of superintendent of .....	96
Repair of .....	87
Rock Creek Park.....	172
Sand:	
Report of inspector of asphalt and cements.....	164
Proposals for furnishing .....	201
Sewers:	
Report of superintendent of .....	113
Disposal project .....	116
Replacing obstructed .....	115
Main and pipe.....	114, 132
Suburban .....	114, 138
Laid under permit system .....	115-122
Laid under assessment system .....	115, 126
Laid at whole cost of applicant .....	130
Flushing basins and connections .....	115
Miscellaneous work.....	140
Constructed under various appropriations, contract work .....	118
Average cost per linear foot of those constructed by day labor .....	144
Reservoirs .....	101
Proposals for constructing sewers .....	187, 189, 198, 199, 201
Sidewalks:	
Around reservations .....	82
Laid under permit system, in city .....	56
Laid under permit system, in county .....	56
Laid under assessment system, in city .....	66
Laid under assessment system, in county .....	66
Street extensions:	
Report of Assistant Engineer W. P. Richards .....	171
Streets:	
Report of computing engineer .....	1
Mileage of paved .....	5
Character and area of pavement of .....	5
Report of superintendent of .....	4
Current repairs to .....	54
Miscellaneous work on .....	84
Repairs to plumbers' cuts in .....	85
Repairs to suburban streets .....	52
Superintendent of parking .....	93
Superintendent of property, report of ( <i>see</i> Materials) .....	177
Superintendent of roads, report of .....	86
Superintendent of sewers, report of .....	113
Superintendent of streets, report of .....	4
Superintendent of repairs .....	159
Superintendent of water department.....	99
Surveyor's office .....	90
Report of surveyor .....	90
Subsurface and building division, report of .....	99
Surface division, report of .....	2
Temporary employees:	
In first division .....	4
In second division.....	110, 144, 149, 178
On roads and bridges .....	4
In sewer and property divisions and engineer stables .....	110, 144, 149, 178

Tests of engineering materials:	Page
Report of inspector of asphalt and cements .....	104
Cement, natural and Portland .....	104
Asphaltic mixtures .....	106, 107, 170
Trees. (See Parking commission.)	
Water registrar and chief clerk, report of .....	113
Water service:	
Report of Capt. Chester Harding .....	97
Distribution .....	100
Mains laid during the year .....	105-106
Revenue and inspection branch .....	111
Report of superintendent .....	97
Length, size, and cost of mains laid during year .....	100
Length, size, and cost of mains laid between 1878 and 1902 .....	100
Cost of laying mains .....	100
Daily consumption of water .....	110
Meters .....	110
Pumped during year .....	100
Pumped per day, mean .....	100
Coal burned .....	100, 101
Cost of pumping during year .....	100, 101
Cost per foot for laying mains .....	100
Cost of mains laid for high service from July 1, 1893 .....	100
Report of water registrar and chief clerk .....	113
Receipts and expenditures during year .....	111-112
Premises supplied with Potomac water .....	112-113
Revenues, comparative statement of .....	113
Wells, number of shallow and deep .....	113
Whole cost work:	
Streets, roads, etc .....	113
Sewers .....	113

MAY 10 1904

339573

---

REPORT  
OF THE  
 OPERATIONS OF THE ENGINEER DEPARTMENT OF THE  
DISTRICT OF COLUMBIA  
FOR  
THE YEAR ENDED JUNE 30, 1903,  
UNDER THE DIRECTION OF  
MAJOR JOHN BIDDLE, CORPS OF ENGINEERS, U. S. A.,  
ENGINEER COMMISSIONER, DISTRICT OF COLUMBIA.

---



---

REPORT  
OF THE  
OPERATIONS OF THE ENGINEER DEPARTMENT OF THE  
DISTRICT OF COLUMBIA

FOR  
THE YEAR ENDED JUNE 30, 1903,

UNDER THE DIRECTION OF  
MAJOR JOHN BIDDLE, CORPS OF ENGINEERS, U. S. A.,  
ENGINEER COMMISSIONER, DISTRICT OF COLUMBIA.

---

**330573**

**EXTRACT FROM THE REPORT OF THE COMMISSIONERS OF THE  
DISTRICT OF COLUMBIA FOR THE YEAR ENDED JUNE 30, 1903.**

**OFFICE OF THE COMMISSIONERS  
OF THE DISTRICT OF COLUMBIA,  
*Washington, November 6, 1903.***

**The PRESIDENT:**

The Commissioners of the District of Columbia herewith submit, for the information of Congress, as required by law, their annual report of the official doings of the government of said District for the fiscal year which ended June 30, 1903.

\* \* \* \* \*

**RAILROAD TERMINAL.**

The work of abolishing grade crossings in the city of Washington and providing a new bridge across the Potomac is well under way. The piers for the new bridge which is to take the place of the Long Bridge have been constructed and some of the ironwork for the superstructure is in place. Work is now in progress on the tunnel on the line of Virginia avenue between South Capitol street and Seventh street east. All streets are to be carried over this part of the line. The land necessary for the new union station, on the line of Delaware avenue between Massachusetts avenue and Florida avenue, has practically all been acquired. Most of the buildings that occupied this land have been removed, and the work of removing the remainder of them is progressing rapidly. The Commissioners have been informed that the work will be pushed with all dispatch, and it is expected that the structures will be sufficiently advanced by the spring of 1905 to permit trains to run in on the new tracks, thus obviating the usual necessity of putting down temporary tracks to accommodate inauguration traffic.

**MUNICIPAL BUILDING.**

The Secretary of the Treasury and the Commissioners of the District of Columbia, acting jointly, are authorized by the municipal building act approved June 6, 1902, to contract for the erection and completion of a fireproof building for the accommodation of the municipal offices of the District of Columbia, the cost of such building, including site, not to exceed \$2,000,000. The site for the building (the old powerhouse square, Fourteenth and D streets) was purchased at a cost of \$550,000. The Engineer Commissioner is executive officer of the com-

#### IV OPERATIONS OF THE ENGINEER DEPARTMENT, D. C.

mission, and Capt. Chester Harding, Corps of Engineers, U. S. Army, was appointed by the President supervisor of construction, having charge of the supervision of plans, construction, etc. Reasonable progress has been made in the preparation of plans and specifications, which must necessarily take several months for a building of this size and character. It is expected that work upon the foundations of the building will be commenced at the beginning of the next calendar year, and that a contract for the building proper will be let sometime during the summer.

##### ROADWAY PAVEMENTS.

During the year the prices paid for sheet asphalt were \$1.56 to \$1.64 per square yard, according to character of base; and for asphalt block \$1.66 per square yard on a gravel base and \$2 per square yard on natural cement base. For the present year the prices are, for sheet asphalt, \$1.51 to \$1.77 per square yard, and \$1.80 per square yard for asphalt block on natural cement base.

Every year the Commissioners receive petitions from residents and property owners on streets paved with granite block, requesting that this class of pavement be replaced with asphalt or asphalt block. It was the practice formerly to gradually do this where public interest was benefited. At the last session of Congress a clause was included in the District appropriation act providing that streets and avenues named in the schedules, already paved with Belgian block or granite, shall not be paved or otherwise improved under the current appropriation. During the past working season some granite-block pavements have been replaced with asphalt, but this work was done under the appropriation for the previous year, and was already under contract before the prohibiting clause referred to above was inserted.

##### SIDEWALKS.

During the year the prices paid for cement walks were \$1.04 and \$1.11 per square yard, the latter price on streets in the county not provided with roadway pavements. The prices this year will be \$1 and \$1.15 per square yard, respectively.

Complaints are made from time to time of the failure to replace old brick sidewalks with improved cement walks. Under the law half the cost of sidewalk work is paid by the owners of the abutting property, either by permit work or assessment. When a petition is received from owners expressing their willingness to pay half the cost, it has been the rule of the office to order the work when public policy authorized. A sufficient number of such requests are usually received to use up the annual appropriation for the purpose. Under this system a number of old walks have not been replaced, since their improvement was not requested by a representative number of owners of abutting property; in fact, in many cases the work has been positively opposed by them. As the voluntary requests for work of this character are, as a rule, sufficient to use up the appropriation, and as the work was in each case desirable, the Commissioners have complied with these requests rather than use the money in forcing walks on owners who objected to paying the half cost. Many of these old walks, however, are in such shape that it is important that they should be renewed whether owners of abutting property are willing or not, and during the

year a number have been replaced with cement. It is hoped to carry the work forward until all the principal thoroughfares are provided with modern walks of cement.

#### BRIDGES.

The current appropriation act carries an item of \$48,000 for continuing work on the Connecticut Avenue Bridge over Rock Creek, with authority to enter into contract for the completion of the bridge at a cost, exclusive of appropriations already made, of \$600,000, the work to be completed within four years from July 1, 1903. The general design of this bridge was determined by a competition held several years ago, which resulted in the selection of the plans of Mr. George S. Morison, of New York, who was also appointed consulting engineer on the work. Mr. Morison died during the past summer, and the Commissioners have not considered it necessary to appoint a successor. Mr. Edward Pearce Casey, of New York, was engaged as consulting architect. The specifications and working drawings are under preparation by Mr. W. J. Douglass, engineer of bridges, and will shortly be completed. It is expected that proposals for the construction of the bridge will be invited within a month or two.

It is very necessary that means be provided for rebuilding the Anacostia Bridge. This bridge is too narrow to accommodate traffic and is structurally weak. The engineer of bridges reports that the stresses are now far in excess of good practice and that the hanger posts in many cases are strained to within a few per cent of their ultimate strength. An item of \$100,000 is included in the estimates to begin the reconstruction of the bridge. It is believed that it would be unsafe and dangerous to defer this work much longer.

The Commissioners have also included in the estimates an item of \$50,000 for constructing a bridge across Piney Branch on the line of Sixteenth street extended. This bridge is necessary on account of the grade of Sixteenth street, which will cross Piney Branch at an elevation of about 60 feet, which will require the construction of a viaduct about 300 feet in length. It is intended that one or two streets and one of the avenues of the highway-extension plans shall be carried under this viaduct, the grade of Sixteenth street making this necessary. The necessity of keeping up the grade of Sixteenth street is because of the high ground to the north and south of Piney Branch and the desirability of having as easy a grade as possible on this main thoroughfare. Present appropriations provide for the improvement of Sixteenth street to within a short distance of Piney Branch, and in order to carry improvements farther northward it will be necessary to provide for crossing the Piney Branch valley.

#### SURVEYOR'S OFFICE.

Owing to activity in building operations and real-estate transactions, the work of this office showed a large increase over the preceding year. Under the present regulation, in the case of foundations of all new buildings erected, a survey has to be made to see that the walls are located on the proper lines. As stated by the surveyor, the necessity for such verification is seen in the very large number of cases where walls are found to be beyond the limit authorized and are encroaching

# VI OPERATIONS OF THE ENGINEER DEPARTMENT, D. C.

either upon public highways or upon a neighbor's lines. The cost is borne by fees, and it is believed that this important work should be kept up by all means, even though it places a heavy burden upon the surveyor's office. His present force is inadequate to handle promptly the present volume of business.

During the year 465 new subdivisions were prepared and recorded. Of these nine were of large tracts in the county. In order to keep up this work under present conditions an increase of force is necessary. This has been asked for in the estimates submitted for the coming year. To indicate the rate at which the work of this office has increased in recent years, a comparison is given below showing what the work was five years ago and what it was last year.

	1898.	1903.
Lots and parcels surveyed.....	600	1,279
Number of subdivisions prepared and recorded.....	120	465
Survey plats prepared.....	1,600	3,431

The fees collected by the office during the fiscal year amounted to \$8,865, which were deposited in the Treasury of the United States as other revenues of the District of Columbia are deposited. The amount appropriated for the support of the office during the year was \$17,800.

The work of this office is all made obligatory by acts of Congress. The private work is about covered by the fees deposited in the Treasury, but the amount appropriated has not been sufficient to do all work promptly and accurately.

## NUMBERING SQUARES IN THE COUNTY.

It is believed that the question of securing a uniform system of squares throughout the District of Columbia should be taken up. The present parcels of subdivided property in the county are now designated by the name of the subdivision in addition to the number of the square and lot, requiring the writing of the name of the subdivision on all tax bills and public records whenever it becomes necessary to describe such a piece of property. By having a system of square numbers the necessity for writing the name of the subdivision would be avoided. The adopted highway-extensions plans which cover the entire District of Columbia have already divided the District into squares, so that it is now possible to devise a system of numbering which would be regular and consecutive for the entire District. By the adoption of such a system the proper numbers of the squares in agricultural tracts could be determined and applied whenever a subdivision is made, even though it be distant or detached from other subdivided property. Of course, this would involve the application of new numbers to the squares in county subdivisions. Objection may be raised to this on the ground of the confusion that might ensue. It is believed, however, that it is entirely practicable to make the change. In the first transfer of a piece of property after the new numbers have been applied both the old and the new number would be given. After that it would be known by the new number. The squares of Georgetown were all renumbered in this manner when it was made a part of the city of Washington some years ago. Such a

system of square numbers would be very valuable for many municipal purposes, particularly for the branch of the service represented by the offices of the assessor and surveyor.

#### TREE SERVICE.

The trees upon streets in the District of Columbia now number 87,407. For several years the annual appropriation for the parking commission has been the same, namely, \$25,000, although the number of trees to be cared for has been increasing at the rate of about 2,500 a year. This appropriation also has to be used for improving reservations under the care of the Commissioners and moving weeds on parkings. There is probably no other single feature that adds so much to the beauty, health, and comfort of the city as its trees, and it is highly desirable that they be properly cared for and the tree service extended as fast as practicable to streets not already so provided. In the estimates for the coming year an additional amount is asked for to provide better care for the trees already planted and also to permit needed planting on streets not now supplied; otherwise the number of new trees that can be planted will be very limited, as the appropriation is hardly more than sufficient to maintain the trees already in existence.

Details of the work of the parking commission are given in the report of Mr. Trueman Lanham, superintendent of parking.

#### ROCK CREEK PARK.

The appropriation for the care and improvement of the park for the year was only \$2,500. This was one of the smallest yearly appropriations in the history of the park, and consequently very little could be accomplished; the money was used to make needed repairs at various points on the roads. The chain gang has been utilized as far as possible and has been of considerable service. During the year Ross road was graded by them for a distance of 3,000 feet and a viaduct constructed to carry the road over a deep ravine. This viaduct was constructed entirely by the chain gang. It is 170 feet in length and is 45 feet high in the center. It is a creditable example of what the gang is capable of doing and of the excellent way in which the foreman has handled his men. Unless means are provided for the opening and grading of the roads in the north half of the park, this beautiful section will be cut off to the driving and riding public. The temporary bridges which have been thrown across the stream are becoming dilapidated and dangerous, and the roads are getting in such a condition that they will have to be closed unless means are provided to improve them.

The creek banks need protection, all roads need repairs and constant watering during dry weather, so that the cost of keeping the park in its present condition is quite considerable. The popularity of the park is steadily growing, and it is hoped that all of this beautiful section of country can soon be provided with good roads and footpaths so as to open it up still further to the public.

#### RETENT ON CONTRACTS.

The law now requires that 10 per cent of the cost of all new works shall be retained as an additional security and a guaranty fund

to keep the same in repair for the term of five years. It is not believed that this requirement is a uniform advantage to the District of Columbia. Experience seems to indicate that in a number of cases the system increases the cost and has a tendency to decrease the number of bidders. On proposals involving a retent some bidders add a substantial amount on account of this provision, so that a large proportion of the retent is so much added profit for them. It is also believed that more bids would be received and keener competition obtained by leaving out the retent proviso, since a number of contractors, especially out-of-town ones, do not care to have a part of their capital tied up for five years in this manner. As the public works are carried on under rigid inspection, the necessity for a retent is not so important, and the experience of the office is that in the great majority of cases this retent is not touched by the Government at all, and in the few cases that use is made of it the amount is small.

#### BUILDINGS AND BUILDING INSPECTION.

The past year has been marked by great activity in building operations. The estimated value of buildings constructed during the fiscal year is \$11,584,603, an increase of \$3,274,363 over the preceding year. One thousand one hundred and ten new dwelling houses and 40 apartments have been added to the buildings of the city. The city has steadily pushed out beyond its original boundaries. The value of buildings erected in the county during the past year is about \$3,500,000, as against \$2,500,000 for the year previous.

The growth of building operations and the increase in the territory to be covered has placed a heavy burden upon the office of the inspector of buildings. Congress has from year to year realized the necessity of increasing the force of this office and has provided more men for it, but the increase in the work has been larger than was anticipated, and it is necessary that still further additions to the personnel be made if this important inspection work is to be handled as it should be. The permit clerk is unable to issue building permits as fast as they are applied for, causing considerable annoyance and delay to builders. The inspector of buildings thinks that two assistant permit clerks should be provided. At least one additional man is essential to handle the present volume of business. In their estimates the Commissioners have asked that one assistant permit clerk be provided.

Another branch of the office that has more work to do than it can properly attend to is that having charge of the inspection of elevators and fire escapes. Two inspectors are supposed to attend to this branch of the service, but the number of buildings containing elevators and provided with fire escapes has so largely increased in recent years and the territory has expanded to such an extent that it is physically impossible for two men to cover the ground efficiently. In addition to the work of inspecting elevators and fire escapes these two inspectors are also required to look after the inspection of heating apparatus, installation of gasoline tanks, location of power boilers, etc. The office would be considerably strengthened by the appointment of a mechanical engineer, who should have charge of the installation of heating apparatus, gasoline tanks, and power boilers, thus relieving the present two inspectors of this duty and permitting them to give

more time to the inspection of elevators and fire escapes. An item has been included in the estimates for a mechanical engineer.

Since the close of the fiscal year competitive plans have been received for the new business high school to be located on square north of square No. 396, bounded by R street, Rhode Island avenue, Eighth and Ninth streets. As a result of this competition, the plans of Mr. B. Stanley Simmons were selected and he is now preparing the plans and specifications preparatory to receiving bids for the building.

#### REPAIR WORK.

The work of keeping in repair the numerous buildings owned by the District of Columbia is growing larger and more important each year. The older a building gets of course the more repairs it needs, and new buildings are annually added to the list of those that have to be cared for. There are now more than 200 buildings to be looked after and more than \$100,000 is spent a year in repairs and betterments. It is believed to be the part of wisdom to keep the buildings under close supervision, making needed repairs as soon as possible after the necessity arises, instead of waiting until time and wind and weather have increased the damage and the cost of repair. The repair shop has never been provided with the facilities that its importance deserves. The shop occupies rented quarters for which a rent of \$50 a month is paid; the building is an old and dilapidated one, without room or provision for carrying the necessary stock of lumber, hardware, paints, castings, etc., as should be done to insure prompt and efficient work. The regular force consists of 1 superintendent, 2 clerks, and 3 foremen. Carpenters, tanners, painters, etc., are taken on from time to time as their services are needed. The largest work of repair is that on school buildings, which has to be done during the summer holidays.

It is believed that the District should have a properly fitted up repair shop of its own, as without such a plant the repairs can not be attended to as promptly and efficiently as they should be, and promptness and efficiency in work of this character means money saved in the long run. The Commissioners have included an item of \$30,000 in their estimates for such a shop. An additional argument in favor of the item at this particular time is the fact that new quarters of some kind will have to be provided within the course of a year or two, as the shop building, No. 13 D street NW., is within the area affected by changes in connection with the new railway terminal improvements.

#### SEWER CONSTRUCTION.

During the year about 16½ miles of sewers were constructed, of which 2.8 miles were main sewers.

Work upon the sewage-disposal project has progressed at a reasonable rate. The expenditures to date on account of completed work amount to \$1,233,092.44. The appropriations to date on account of work in progress aggregate \$1,985,000. The estimated cost of completing the system is \$1,729,000. This is asked for in the estimates for the coming year. If the necessary money is appropriated, the system should be completed by the end of 1905.

## WATER SERVICE.

During the year 11 miles of new water mains were laid and 30 new fire hydrants erected. Plans have been completed for a water tower and watchman's lodge adjacent to the Reno reservoir, and it is expected that the work will be completed during the present year. The water tower is intended to supply water to premises above the 350-foot level, the present reservoir not having a sufficient elevation for this purpose.

During the year 1,448 additional buildings were connected with the public water system, making the present number 49,249. Two hundred and fifty-five new meters were installed, the present number being 1,748.

The District of Columbia appropriation act approved March 3 last contained an item of \$2,000 for introducing the card-record system in the office of the water registrar. This work, which involved the writing of between 50,000 and 60,000 cards, and indexing the same, was completed in time for the system to be used at the beginning of the fiscal year, July 1, 1903, and has been working smoothly. The work was done at a cost of about \$1,300.

Details of the operations of the water department are given in the reports of the superintendent and the water registrar.

## WATER REVENUES.

The law provides that the water rates shall never be a source of revenue other than as a means of keeping up a supply of water, but shall constitute a fund exclusively for the maintenance, management, and repair of the system of water distribution. This system of distribution is maintained entirely from the revenues of the water department; the United States does not pay any part of the cost of keeping up this branch of the service. The sources of revenue are water rents, water-main taxes (a special assessment of \$1.25 per front foot against property abutting a street in which a main is laid), and fees for taps and permits. The average water rent in the District of Columbia is about \$7 per house per year, which average includes large water takers served through meters. The rent is calculated on the width and height of the house where the water is used for domestic purposes; in the case of hotels, business houses, and other establishments where the amount used is large, the supply is by meter, at the rate of 3 cents per thousand gallons.

The law requires that the water rates shall be uniform throughout the District, and authorizes the establishment of a scale of rates for the different classes of buildings "according to their size, dimensions, assessed values, exposures to fires, uses for dwellings, stores, shops, stables, manufactories, or other purposes, number of occupants, or consumption of water, measured by meter or otherwise." For over forty years water rents charged dwellings have been calculated on the basis of the width and height of the house. This basis has therefore become established by long usage and is generally known throughout the District.

Recently complaints have been made that the rates are not uniform and that they are excessive, as evidenced by the balance to the credit of the water fund.

This balance has been decreased \$110,000 during the past year on account of laying new trunk mains, work on the new pumping station, etc. The current revenues are inadequate to provide for these betterments, and were it not for the surplus accumulated, this necessary work could not be done without creating a deficit in the water fund. The balance on hand, together with the surplus of each year, is not more than sufficient to cover improvements projected. It would therefore be inadvisable to fix the rates, even if possible, so that the collections of one year, including assessments, should exactly meet the ordinary expenses, without making any provision for emergencies or to enlarge and improve the system.

As to a change in the basis of calculating water rents, it would probably be possible to devise a more intricate and costly system that would make nicer distinctions between houses of different "dimensions, assessed values, exposures to fires," etc. Any change, no matter upon what basis, would be open to objections. It is comparatively easy to apply a rule uniformly to the different classes of cases; it is extremely difficult, however, to devise a set of general rules that will apply with uniform justice to every particular case. There is only one way known to the office of doing this, and that is by the owner of the house installing a water meter and paying for the amount of water actually used. The office will be very glad to have owners install meters if they desire to do so, but the Commissioners do not wish to force the use of meters upon owners of dwellings who do not want them, nor to change old-established customs until there appears to be a general and well-founded demand for it.

The water-rent regulations formerly provided for a charge of 50 cents per room per year in the case of rented rooms. This regulation during the past year was revoked as it was found to work unjustly.

#### DISTRICT STABLES.

Congress has enacted that "all horses, buggies, or carriages owned or maintained by the District of Columbia shall, so far as may be practicable, be provided for in stables owned or operated by said District." This is done at the stables of the engineer department at Second and Canal streets SW., and on U street near Sixteenth NW. These stables are crowded to care for the horses now quartered there and no more animals can be cared for until more room is provided. A superintendent and two hostlers are employed, who look after the stalls, feed, harness, etc., the drivers being required to care for their own horses and vehicles.

\* \* \* \* \*

Very respectfully,

HENRY B. F. MACFARLAND,  
HENRY L. WEST,  
JOHN BIDDLE,

*Commissioners of the District of Columbia.*



# REPORT OF THE OPERATIONS OF THE ENGINEER DEPARTMENT.

## SURFACE DIVISION.

Capt. H. C. NEWCOMER,

*Corps of Engineers, United States Army, Assistant to the Engineer Commissioner, in charge.*

HIGHWAYS (STREETS, ROADS, BRIDGES, ETC.).....	C. B. HUNT, <i>Engineer of Highways.</i>
Sidewalks and alleys .....	H. N. MOSS, <i>Superintendent of Streets.</i>
Maintenance of county roads .....	MORRIS HACKER, <i>Superintendent of Roads.</i>
Construction and care of bridges .....	W. J. DOUGLAS, <i>Engineer of Bridges.</i>
SURVEYOR'S OFFICE .....	H. B. LOOKER, <i>Surveyor, District of Columbia.</i>
PARKING COMMISSION.....	TRUEMAN LANHAM, <i>Superintendent of Parking.</i>

## REPORT OF ASSISTANT IN CHARGE.

OFFICE OF THE ENGINEER COMMISSIONER, DISTRICT OF COLUMBIA,  
*Washington, October 22, 1903.*

MAJOR: I have the honor to transmit herewith annual reports giving in detail the operations during the fiscal year ending June 30, 1903, of the surface division, the surveyor's office, and the parking commission, namely:

Report of the engineer of highways, including reports of the superintendent of streets, superintendent of roads, and the engineer of bridges.

Report of the surveyor, District of Columbia.

Report of the superintendent of parking.

These reports describe quite fully the work done under the different offices, and reference is made to them for such details as may be desired. In submitting these reports it is desired to call special attention to the urgent need of larger appropriations for repairs to streets, avenues, and alleys, in order to replace many of the old asphalt pavements that can no longer be kept in fair condition at reasonable expense. In most cities the average life of an asphalt pavement is held to be from 10 to 12 years. In Buffalo, N. Y., where the experience with such pavements has probably been more favorable than in any place except Washington, the life of the asphalt pavements on business streets is considered to be from 10 to 12 years and on residence streets from 12 to 15 years. In Washington the pavements are expected to last from 15 to 20 years, with an average age of probably 18 years before they have to be relaid. The average age of the pavements resurfaced during the past fiscal year was slightly over 21 years. The age of some of the old pavements is not known exactly, as they were laid at a time when complete records were not kept. Taking those, however, whose age is known the following table gives the areas of pavement for each different

## 2 OPERATIONS OF THE ENGINEER DEPARTMENT, D. C.

year of age for those pavements that are no longer under guarantee by contractors, that is, those pavements that have an age of 5 years or more:

### *Age of pavements July 1, 1903.*

Age (years):	Square yards.	Age (years):	Square yards.
5 .....	97,642	20 .....	108,335
6 .....	99,967	21 .....	95,762
7 .....	81,497	22 .....	106,439
8 .....	109,128	23 .....	126,657
9 .....	105,693	24 .....	66,949
10 .....	101,296	25 .....	35,417
11 .....	130,745	26 .....	21,899
12 .....	209,632	27 .....	15,041
13 .....	202,134	28 .....	30,682
14 .....	165,746	29 .....	1,642
15 .....	59,668	30 .....	23,254
16 .....	97,607	31 .....	7,330
17 .....	70,841		
18 .....	45,154		
19 .....	60,967		
			2,277,144

The average age of the 2,277,144 square yards of asphalt pavement covered by this table is about 14.8 years. It will be observed, too, that there are over 700,000 square yards of pavement that are over 18 years old. For several years it has been necessary to maintain, by expensive repairs, considerable areas that should have been resurfaced, but which could not be so treated on account of the lack of funds.

The following table gives the appropriations for repairs to streets and the area of asphalt pavements for each year since 1890. It will be observed that for a number of years a practically constant sum has been provided, while the area of pavements to be maintained has increased very largely.

### *Repairs to asphalt pavements, 1890 to 1903.*

Year.	Appropriations.	Asphalt pavements.
		<i>Square yards.</i>
1890.....	\$255,000	1,538,733
1891.....	165,000	1,969,797
1892.....	195,000	2,064,459
1893.....	190,000	2,122,443
1894.....	190,000	2,159,445
1895.....	185,000	2,218,959
1896.....	180,000	2,355,802
1897.....	180,000	2,443,217
1898.....	180,000	2,608,643
1899.....	180,000	2,668,131
1900.....	180,000	2,726,489
1901.....	200,000	2,775,000
1902.....	200,000	2,831,108
1903.....	200,000	a 2,882,000

a Estimated.

It is believed that the above facts, especially if considered in connection with an inspection of many of the older pavements that can no longer be kept in satisfactory condition by repairs, would convince anyone that larger appropriations for repairs of streets are imperatively needed.

Very respectfully,

H. C. NEWCOMER,  
Capt., Corps of Engineers, U. S. Army,  
Assistant to Engineer Commissioner, District of Columbia.

Maj. JOHN BIDDLE,  
Corps of Engineers, U. S. Army,  
Engineer Commissioner, District of Columbia.

## REPORT OF THE ENGINEER OF HIGHWAYS, DISTRICT OF COLUMBIA.

WASHINGTON, D. C., July 1, 1903.

SIR: I have the honor to submit the following report of the operations of the surface division of the engineer department of the District of Columbia for the fiscal year ended June 30, 1903:

The total amount of the funds appropriated by Congress and deposited by corporations and others for disbursement by the surface division during the fiscal year aggregated about \$950,000, of which about \$250,000 was for paving alleys and sidewalks throughout the District of Columbia, \$300,000 for paving new streets and repaving and repaving old ones within the city limits, about \$230,000 for construction and repair of suburban streets and county roads, about \$70,000 for the maintenance and construction of bridges throughout the District, while approximately \$100,000 was spent in repairing pavements disturbed by excavations on account of various corporations, plumbers, and other branches of the District government.

*Summary statement of work under appropriations for "Work on sundry streets and avenues," "Construction of county roads," and "Paving roadways under permit system."*

Character of work.	Streets and avenues.	County roads and suburban streets.	Paving roadways.	Total.
Asphalt, 6-inch base.....square yards..	34,367	18,578	.....	47,945
Vitrified block gutters.....do.....	5,700	1,966	.....	7,666
Asphalt block.....do.....	29,687	4,140	215	34,042
Macadam roadways.....do.....	.....	50,000	.....	50,000
Cobble gutters.....do.....	.....	12,000	.....	12,000
Ordinary grading.....cubic yards..	15,000	108,206	528	123,734
Macadam grading.....do.....	7,000	1,000	.....	8,000
Old cobble and granite removed.....square yards..	40,000	5,000	.....	45,000
Old curb removed.....linear feet..	10,000	2,000	.....	12,000
Curb set.....do.....	20,000	12,000	.....	32,000
Curb reset.....do.....	26,000	1,500	.....	27,500

In the report of the superintendent of streets all day-labor work under the appropriation for "Repairs to streets" is consolidated. It seems proper to segregate certain items of work, which is accordingly itemized, as follows:

The roadways of B street NW., between Seventeenth street and Virginia avenue, and of Virginia avenue NW., between B and E streets, were macadamized; extensive repairs were made to the asphalt-block roadway of Maryland avenue NE., east of Sixth street; the roadway of Seventeenth street NW., between B and E streets, was macadamized in part—the work to be completed during the current fiscal year; the intersection of Twelfth street, K street, and Georgia avenue SE. was brought to the established grade, and the intersecting streets and alleys were regulated.

The principal items of work under the appropriation for "Repairs to roads" were: The west roadway of Brightwood avenue was macadamized from Trenton street to Wallach street, and the east roadway from the Rock Creek Church road northward was similarly treated. The Bunker Hill road was macadamized between the Sargeant and the Queens Chapel roads. Wisconsin avenue was macadamized from Galveston street to the Nourse place. Pomeroy street was macadamized from Fourth street to Moores lane. Ingraham place was macadamized from Brightwood avenue to Colorado avenue. The Rock Creek Ford road was regulated and improved between the Military road and the Broad Branch road. Portions of Blagden avenue near Sixteenth street were macadamized. Twenty-fourth street NE. was macadamized between Detroit and Cincinnati streets, and Cincinnati street was similarly treated between Twenty-second and Twenty-fourth streets. Kenesaw avenue was macadamized between Fourteenth and Mount Pleasant streets. Sherman avenue was macadamized between Irving and Harvard streets. Carroll avenue was macadamized between the Blair road and the District line, and portions of the Bennings road were macadamized.

The following is a list of tables appended with this report:

Table A.—Street railways in the District of Columbia, July 1, 1903.

B.—Statement of character and extent of street pavements, July 1, 1903.

C.—Statement of mileage of street pavements, July 1, 1903.

D.—(Table D omitted.)

- E.—Schedules of work on streets and avenues and county roads and suburban streets.
- F.—Repairs to asphalt and concrete pavements for the year ended June 30, 1903.
- G.—Work done at cost of railroad companies.
- H.—Work done by day labor under appropriation for "Current repairs to streets, avenues, and alleys."
- I.—Regular permit.
- K.—Assessment work.
- L.—Replacing and repairing sidewalks and curbs around public reservations.
- M.—Miscellaneous work.
- N.—Whole-cost work.
- O.—Repairs to cuts by plumbers and others.
- P.—Grading by the chain gang.

As an incident to the expenditure, by contract, of the bulk of the appropriation for "Improvement and repairs," "Repairs to concrete pavements," and "Construction of county roads," and on account of other appropriations, there were executed miscellaneous items of work by day labor during the year, as shown in detail in Table M. This work amounted to \$22,309.31.

The reports of the superintendent of streets, superintendent of roads, and the engineer of bridges are transmitted herewith.

The continued use of trap rock for macadam purposes has been further encouraged by the results of longer experience with the material. The roadways which have been built since the District quarry was opened are by far the best of their class in the District, and besides being more satisfactory as to their surface condition they indicate substantial economies in the matter of repairs.

The work of the chain gang deserves mention, since while representing but a small aggregate expenditure of the appropriation yet the results are most advantageous and economical, the cost of grading done under the appropriation for this purpose during the past year being less than 15 cents per cubic yard. It is noted with satisfaction that the appropriation for the ensuing fiscal year for this purpose has been sufficiently increased to permit the work to be continued throughout the year without interruption, instead of being necessarily suspended toward the close of the year for lack of funds.

A notable item of paving work executed during the year was the widening and paving of Columbia road from Sixteenth to Eighteenth street, at a total cost of \$30,000, in connection with which work the Metropolitan Street Railway Company extended its tracks by the underground system, with electrical propulsion, from Eighteenth to Sixteenth, and thence out Mount Pleasant street to Park street.

Under special provision by appropriation Eleventh street extended was graded and macadamized from Florida avenue to Whitney avenue, and New Hampshire avenue from Whitney avenue to Brightwood avenue was similarly treated.

The act providing for a union railroad station in the District of Columbia passed Congress and became a law on the 28th of February, 1903, and preparations were made on the part of the District and of the railroads for the early inauguration of the construction work provided for therein. During the fiscal year but little more than preparations and acquisition of property on the part of the railroad was accomplished.

I desire to renew the recommendation contained in my last annual report that the items for the construction of county roads be consolidated so that they can be disbursed and accounted for as a single aggregate fund rather than as so many separate items of appropriations. During the past year these items were eighteen in number, and the practical difficulties, both in the office and in the conduct of the work, of maintaining separate balances on each item were very considerable. Such a segregation is not customary in the paving of streets under the operation of the schedule within the city limits, and it is not appreciated that there can be fair objection to a similar arrangement in regard to county work; certainly there would no increase in expenditure. The recommendation has had, and continues to have, the indorsement of the auditing department.

Collections on account of assessments for special improvements, such as alleys and sidewalks, are repaid and credited to the appropriation for assessment and permit work for the fiscal year in which the collection is made. The repayments on this account, as well as on account of general taxes, are customarily relatively heavy toward the end of the fiscal year, especially in May, and it is a constant occurrence that after the expiration of a fiscal year this office is confronted with the existence of a large unexpended balance of the appropriation due to these repayments, which could not be guarded against by more active construction operations before the amount of the repayments were known. As a result of this, the contracts under

which the appropriation is expended are never completed until late in the fall, and the contract for the past fiscal year for laying sidewalks will probably not be completed for eight or nine months after the expiration of the fiscal year. These conditions, under the present arrangement of the repayments, are practically unavoidable. The remedy is a simple one; involves no increase in expenditures; appears to possess advantages from whatever point of view it is regarded, and consists in crediting the collections for these special improvements in equal parts to the revenues of the District of Columbia and the United States and increasing the appropriation for assessment and permit work by the average total of these collections. With this provision the amount of the appropriation would be definitely known at the beginning of the year, and arrangements for its expenditure practically within the fiscal year could be made. I recommend that this be presented to Congress in the estimates for the ensuing fiscal year, and that the change be urged as of great practical advantage.

The requirement of the organic act, under which the present District government was organized, that 10 per cent of the cost of all work executed under contract shall be retained for five years is at times a hardship to the District. There are classes of work performed by contract on which no practical occasion for any retention exists, and others where a much shorter period of retention could with equal advantage be named; in either event the District is put to an unwarranted expense, which in the aggregate amounts to several thousand dollars each year. If the amount and period of guarantee could be made discretionary with the Commissioners, instead of being invariable, there would result a substantial economy and a conformity to the approved practice of other municipalities.

My acknowledgments are due to the employees of the surface division for the work accomplished by the office during the year.

Respectfully submitted.

C. B. HUNT,

*Engineer of Highways, District of Columbia.*

Maj. JOHN BIDDLE,

*Corps of Engineers, U. S. Army,*

*Engineer Commissioner, District of Columbia.*

(Through Capt. H. C. Newcomer.)

TABLE A.—Street railroads in operation in the District of Columbia July 1, 1903.

Name of company.	Tracks in use, owned by company.			
	Underground electric.		Overhead electric.	
	Double.	Single.	Double.	Single.
Washington Traction and Electric Co.:	<i>Miles.</i>	<i>Miles.</i>	<i>Miles.</i>	<i>Miles.</i>
Metropolitan R. R. ....	10.18	4		
Columbia Rwy. ....	2.77		4.12	0.89
City and Suburban Rwy. of Washington .....	4.06	2.36	5.58	
Brightwood Rwy. ....			5.93	
Georgetown and Tennallytown Rwy. ....			4.16	
Anacostia and Potomac River R. R. ....	6.52		1.46	1.64
Washington and Great Falls Electric Rwy. ....			3.88	
Washington and Glen Echo R. R. ....			.10	
Capital Traction .....	13.44	3.26	3.57	
Baltimore and Washington Transit. ....				.43
Washington, Alexandria and Mount Vernon Electric Rwy. ..	.90	.33		
Total .....	37	9.93	28.80	2.96

TABLE B.—Statement of character and extent of street pavements July 1, 1903.

Section.	Asphalt and coal tar.	Asphalt block.	Vitrified block.	Granite.	Cobble.	Macadam.	Gravel.	Total.
	<i>Sq. yds.</i>	<i>Sq. yds.</i>	<i>Sq. yds.</i>	<i>Sq. yds.</i>	<i>Sq. yds.</i>	<i>Sq. yds.</i>	<i>Sq. yds.</i>	<i>Sq. yds.</i>
Northwest .....	1,889,441	30,600	13,943	180,613	108,298	71,524	119,576	2,393,965
Northeast .....	243,591	156,966		17,147	1,738	55,314	469,573	944,329
Southeast .....	149,446	183,425		56,845	31,293	104,917	434,684	960,610
Southwest .....	162,491	42,485	2,943	233,973	59,578	41,606	153,530	696,606
Georgetown .....	141,995	16,134		60,363	21,872	10,937	39,653	290,964
Suburban .....	299,822	41,851		32,254		1,080,000	1,425,613	2,829,540
Total .....	2,886,786	471,461	16,846	561,195	222,779	1,314,298	2,642,629	8,115,964

TABLE C.—Statement showing mileage of street pavements July 1, 1905.

Section.	Asphalt and coal tar.		Asphalt block.		Vitrified block.		Grand total.
	<i>Feet.</i>	<i>Miles.</i>	<i>Feet.</i>	<i>Miles.</i>	<i>Feet.</i>	<i>Miles.</i>	
Northwest .....	415,619	78.71	8,590	1.63	2,250	0.42	41,859
Northeast .....	64,857	12.28	32,982	6.24	.....	.....	4,700
Southeast .....	39,087	7.40	44,437	8.42	.....	.....	15,405
Southwest .....	41,605	7.88	11,528	2.18	500	.10	55,715
Georgetown .....	39,617	7.50	5,493	1.04	.....	.....	17,371
Suburban .....	75,309	14.26	12,453	2.36	.....	.....	9,370
Total .....	676,094	128.03	115,453	21.87	2,750	.52	144,367

Section.	Cobble.		Macadam.		Gravel.		Total.
	<i>Feet.</i>	<i>Miles.</i>	<i>Feet.</i>	<i>Miles.</i>	<i>Feet.</i>	<i>Miles.</i>	
Northwest .....	19,101	3.62	14,887	2.82	38,292	7.25	540,627
Northeast .....	750	.14	11,922	2.26	121,663	23.04	236,524
Southeast .....	8,623	1.63	27,546	5.22	110,449	20.90	245,563
Southwest .....	12,072	2.29	9,820	1.86	43,533	8.24	174,774
Georgetown .....	7,924	1.50	3,320	.63	11,891	2.16	85,016
Suburban .....	.....	.....	309,250	58.57	674,061	127.66	1,080,470
Total .....	48,470	9.18	376,745	71.36	999,389	189.25	2,363,205

streets and avenues for year

THWEST SECTION.

Curved.	Straight curb reset.	Circular curb reset.	Straight curb reset.	Set t.
Lin. ft.	Lin. ft.	Lin. ft.	Lin. ft.	
539	628.79	129.68	1,439.	00
				00
				15
				00
				00
				00
				00
				00

Name of contractor.

Barber Asphalt Paving Co.  
Do.  
Do.  
Do.  
Do.  
Do.  
Do.  
Do.

THWEST SECTION.

90	500.39		90	74
22.40	1,234.25	43.67	92	92
87	2,519.23		94	97
			927	

Washington Asphalt Block and Tile Co.  
Do.  
Do.  
Do.

THEAST SECTION.

18	1,159.86	62.85	127	22
80	711.62		80	09
46	1,041.94	171.73	1,059	73
103	62.06	27.90	399	25
89	1,408.78	90.90	61	06
1.30	1,257.52		16	98

Washington Asphalt Block and Tile Co.  
Do.  
Do.  
Do.  
Do.  
Do.  
Do.

THEAST SECTION.

12	1,152.88		25	88
02	1,153.49		1,304	62
	653.43		50	25
60	991.53		200	72
43	1,198.02	18.09	96	50
49	864.69	37.64	198	69

Barber Asphalt Paving Co.  
Do.  
Do.  
Do.  
Washington Asphalt Block and Tile Co.  
Do.  
Do.

GETOWN SECTION.

			0.00	
--	--	--	------	--

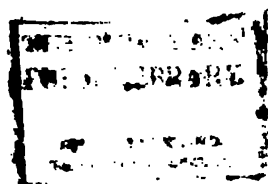
Barber Asphalt Paving Co.

CIAL SCHEDULE.

			0.00	
103	215.48	110.45	2,112	9.44
394	1,254.95	17.08	237	7.47
272	1,200.42			7.08

Barber Asphalt Paving Co.  
Do.  
Washington Asphalt Block and Tile Co.  
Do.

Surface. b Estimated.



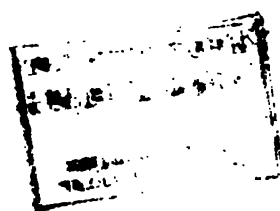
# roads and suburban streets

work.

Old curb re- moved.	Straight curb reset.	Circular curb reset.	Cost per sq. ft.	Name of contractor.
Lin. ft.	Lin. ft.	Lin. ft.		
			0.00	Barber Asphalt Paving Co.
			34.92	(Brennan Construction Co.
			0.00	M. F. Talty.
			0.00	Do.
			7.58	Barber Asphalt Paving Co.
			0.00	Day labor.
			1.70	Do.
			8.10	M. F. Talty.
			2.89	Do.
			8.66	T. M. Bond.
			8.05	G. B. Mullen.
82			1.35	M. F. Talty.
61			35.12	Do.
			7.83	Do.
			9.98	Colburn, \$1,780.80; Blundon, \$801.72; Huidek per, \$226.84.
	173.22		8.57	Barber Asphalt Paving Co.
				Do.
	522.68		24.74	Washington Asphalt Block and Tile Co.
			2.47	G. B. Mullen.

\* Includes 205 yards bitum appropriation.

## Paving roadways under

and concrete pavements

Cranford Paving Company under

New gutters.			Original pavement.	
Station.	Number of vitrified blocks.	Grading and removal old material.	Year laid.	Contractor.
		<i>Cub. yds.</i>		
15	11,974	90	1887	Resurfaced by H. L. Cranford.
19	20,500		1890	Cranford Paving Co.
49			1896	Do.
69	12,600	173	1879	J. S. Baldwin.
23	14,299	31	1888	P. Maloney.
36	12,056	51	1879	J. S. Baldwin.
08	5,576	25	1887	Barber Asphalt Paving Co.
86	6,118	26.50	1887	H. L. Cranford, for George Truesdell.
33	5,638		1877	Cranford & Hoffman.
94	7,705	165	1880	J. S. Baldwin.
77	15,031	130	1875	Cranford & Hoffman.
22	6,341	90	1895	Cranford Paving Co.
96	21,288	175	1873	J. W. Vandenberg & Co.
42	19,474	107	1882	H. L. Cranford.
82	45,880	323	1883-84	Do.
59	1,590		1873	J. O. Evans.
94	1,010		1873	Do.
95	550		1876	Neitzey & Acker.
			1883	Barber Asphalt Paving Co.
				United States Government.
99	207,630	1,386.50	4	

Square yards ny.

THE NEW YORK  
PUBLIC LIBRARY  
ASTOR LENOX AND  
TILDEN FOUNDATIONS

TABLE (I).—Work of street paving and repairs chargeable to street railroads for year ending June 30, 1903.

## WASHINGTON RAILWAY AND ELECTRIC COMPANY.

Street.	From—	To—	Amount.
Connecticut avenue.....	Eighteenth.....	Dupont circle.....	\$472.79
Do.....	Leroy.....	Wyoming.....	55.48
and SW.....	C.....	Virginia avenue.....	4,346.06
ard NW., intersection New York avenue.....	Y.....		29.17
th NE.....	T.....	V.....	278.17
th SE.....	Pennsylvania avenue.....	L.....	55.47
teenth SW., entrance to park.....			122.41
st NW.....	Pennsylvania avenue.....	Maryland avenue.....	860.23
NW.....	Sixth.....	Seventh.....	223.99
NE.....	North Capitol.....	First.....	702.43
NW.....	Seventh.....	Ninth.....	279.31
North Capitol.....	G.....	H.....	223.14
Do.....	R.....	T.....	1,104.98
Do.....	T.....	V.....	280.50
st Capitol.....	Fourteenth.....	Fifteenth.....	342.43
Florida avenue.....	First.....	Fourth.....	53.34
teenth.....	Columbia road.....	Park.....	742.10
acostia road.....			410.00
<i>Minor repairs.</i>			
SW.....	Twelfth.....	Fourteenth.....	63.91
NE.....	Delaware avenue.....	First.....	4.55
NW.....	New Jersey avenue.....	Third.....	11.83
NW.....	Ninth.....	Eleventh.....	19.11
NW.....	do.....	Fourteenth.....	33.88
NW.....	North Capitol.....	Fifteenth.....	251.34
N E and NW.....			168.35
Delaware avenue.....	Delaware avenue.....	Second.....	4.55
Connecticut avenue.....	K.....	Dupont circle.....	141.36
Dupont circle.....			50.05
st Capitol, intersection Second.....			7.28
Massachusetts avenue.....	Fourth.....	Seventh.....	155.74
New Jersey avenue.....	C.....	New York avenue.....	57.64
North Capitol, intersection New York avenue.....			16.01
New York avenue.....	Ninth.....	Fourteenth.....	88.80
First NW.....	E (intersection).....	D.....	7.28
Fourth NW, intersections G and Q.....			20.96
four-and-a-half.....	Missouri avenue.....	Maryland avenue.....	47.63
Sixth.....	Pennsylvania avenue.....	Louisiana avenue.....	87.50
ighth SE.....	do.....	L.....	6.87
Fifth NW.....			13.65
Ninth NW.....	Pennsylvania avenue.....	P.....	214.27
Eleventh NW.....			.91
Seventeenth.....	H.....	K.....	3.02
Fourteenth.....	New York avenue.....	B.....	87.61
			12,145.59

## CAPITAL TRACTION COMPANY.

First NW.....	Pennsylvania avenue.....	Maryland avenue.....	\$421.59
Connecticut avenue extended west of Rock Creek.....			550.00
Repairs made in Connecticut avenue, Pennsylvania avenue, and Eighth SE. paid directly to paving contractor, not shown above.			
<i>Minor repairs.</i>			
M.....	Twenty-eighth.....	Thirty-sixth.....	59.84
V.....	Ninth.....	Seventeenth.....	28.21
Pennsylvania avenue, SE and NW.....			246.64
Eighth, SE.....	Intersection.....	G.....	1.82
Fourteenth, NW.....	Second.....		115.12
Fifteenth, NW.....			17.85
Seventeenth, NW.....			1.82
Twenty-sixth, NW.....	Pennsylvania avenue.....	M.....	5.46
			1,463.35

## WASHINGTON, ALEXANDRIA AND MOUNT VERNON RAILROAD.

E, NW.....	Thirteen-and-a-half.....	Fourteenth.....	\$4.55
------------	--------------------------	-----------------	--------

TABLE H.—*Work done by day labor under appropriation of "Current repairs to streets, avenues, and alleys" from July 1, 1902, to June 30, 1903.*

Brick sidewalks laid.....	square yards..	3, 157. 00
Brick sidewalk relaid.....	do.....	25, 276. 00
Asphalt block paved.....	do.....	1, 197. 10
Asphalt block repaved.....	do.....	3, 085. 00
Vitrified brick repaved.....	do.....	1, 275. 00
Vitrified block paved.....	do.....	1, 328. 25
Vitrified block repaved.....	do.....	1, 314. 00
Cobble paved.....	do.....	11, 582. 00
Curb set.....	linear feet..	5, 005. 17
Curb reset.....	do.....	2, 292. 00
Flag laid.....	do.....	797. 00
Flag relaid.....	do.....	4, 055. 00
Granite block.....	square yards..	3, 676. 00
Asphalt tile sidewalk relaid.....	do.....	5, 084. 00
Cement sidewalk.....	do.....	22. 21
Grading.....	cubic yards..	4, 467. 82
Graveling.....	square yards..	2, 003. 00
Sewer pipe.....	linear feet..	120. 00
Labor.....		\$25, 847. 94
Material.....		2, 740. 56
Total.....		28, 588. 50

Dangerous holes repaired, 2,872.



TABLE I.—*Reps*

Job No.	Location.	For whom done.	Grading.	Cement sidewalk.	Curb re-set.
			<i>Cu. yds.</i>	<i>Sq. yds.</i>	<i>Lin. ft.</i>
2000	Alley rear lots 8 and 9, square 67 .....	Thos. F. Walsh .....			
2001	Alley, square 198 .....	Mrs. M. L. Norton .....			
2002	Lots 147-148, Wright and Dole's subdivision.	T. E. O'Conner .....	230		
2003	Alley, block 10, Bloomingdale .....	C. A. Kineesl .....	10		
2006	West side Twelfth street NW., between N and O streets.	Mary E. Goff .....		112.18	5
2008	Alleys, blocks 1 and 2, Fernwood Heights.	E. J. Stellwagen .....	4,009		
2017	West side Seventeenth street NW., between G and Pennsylvania avenue.	Geo. A. Fuller Co .....			224
2018	300 Second street SW .....	John Daly .....	1.50		
2021	Northwest corner Third and G streets NW	Alonzo O. Bliss .....			4
2022	1705 K street NW .....	Cranford Paving Co .....			
2023	1440 M street NW .....	Clement Brown .....		134.22	8
2024	314-316 C street SE .....	Geo. R. Repettl .....		28.21	35
2025	1314 Thirtieth street NW .....	W. J. O'Donnell .....		23.04	30
2027	Alley, square 529 .....	Alonzo O. Bliss .....	10		54.71
2028	251 N street NW .....	John H. Ruppert .....		30.46	20
2029	North side B street NW., between Seventh and Ninth streets.	Washington Market Co. ....		902.71	258
2030	Northeast corner Brown street and Howard avenue.	Geo. S. Cooper .....	28		3
2032	West side Eleventh street NE., between Massachusetts avenue and East Capitol	Speiden & Speiden .....		164.60	
2033	2251 Eighth street NW .....	W. M. Taylor .....			
2034	Southwest corner Seventh and Maryland avenue NE.	Geo. Eakle .....			5.15
2035	515 L street NW .....	Mrs. A. F. Ryneex .....		22.18	
2036	1412 New York avenue NW .....	Chas. Eckstein .....		57.46	
2037	1422 C street SE .....	Chas. F. Schorb .....	6		34
2039	South side Thirteenth street NE., between E and D streets.	James Denison .....	40	97.79	
2040	Southeast corner Eighth and D streets SE.	Mrs. E. A. Haines .....		276.27	174
2041	Alley rear of lots 48 to 56, square 1270 ..	R. W. Walker & Son .....			4
2042	21 M street NW .....	Ruth G. D. Havens .....		24.17	
2044	East side Piney Branch road, between Park and Sheridan.	C. W. King, Jr .....	7.50		
2045	208 Massachusetts avenue NE .....	F. M. Finley .....	4		3
2046	West side Fifteenth street and east side Kentucky avenue, square 1062.	Thos. Gordon .....	10	260.39	32
2047	Lanier avenue, front lots 152 to 157 .....	James M. York & Son .....	90	106.13	
2048	1432 Binney street NW .....	P. J. Brennan .....		47.24	
2049	Alleys, Le Droit Park, between V and W, First street and Flagler place.	M. F. Talty .....	400		
2050	South side U street NW., between North Capitol and First.	Moore & Barbour .....	125	5.50	
2051	South side U street NW., between North Capitol and First.	do .....			40.25
2052	1523 New Hampshire avenue NW .....	M. F. Lodge .....		27.59	3
2054	North side Rhode Island avenue NE., between North Capitol and Lincoln avenue.	Moore & Barbour .....			20.50
2055	3601-3603 M street NW .....	National Capital Brewing Co. ....		56.77	
2056	Lots 54, 55, 56, 70, 71, 72 Hanover place ..	D. B. Groff .....		73.84	52
2057	East side Thirteenth street NW., lots 23, 24, 25, block 21, Columbia Heights.	L. E. Breuninger .....		44.95	
2058	Tenth and G streets NW .....	Woodward & Lothrop .....		244.52	
2059	918-920 Fifteenth street NW .....	A. L. Bliss .....		61.81	55
2060	North side Rhode Island avenue, between North Capitol and Lincoln avenue.	Moore & Barbour .....	590		
2061	St. Joseph's Orphan Asylum .....	P. J. Brennan .....		187.69	164
2062	918 Eighteenth street NW .....	Arthur Cowsill .....		24.18	23
2063	3034 Q street NW .....	W. A. Kimmel .....		24.93	18
2064	210 Maryland avenue NE .....	P. V. De Graw .....		28.59	
2065	Southeast corner Thirty-fifth and P streets NW.	W. Riley Duble .....			28.30
2066	Fourteenth street NW, between E and F streets.	E. J. Stellwagen .....			
2067	1501 Eighteenth street NW .....	Mrs. Otis Bigelow .....		118.52	
2068	717 Twelfth street NW .....	B. F. Edwards .....		27.35	33.40
2070	735 Sixth street NE .....	Mrs. A. C. Weisenborn .....		20.78	
2071	518 Fifth street NW .....	M. W. Moore .....		42.52	10
2072	Southwest corner First and D streets NW.	W. M. Galt & Co .....			
2073	1725 Nineteenth street NW .....	O. R. Seward .....		19.60	
2074	Highland apartment house, south side California avenue.	John L. Weaver .....	80	87.43	
2075	910, 912, 914 W street NW .....	H. W. Van Senden .....		55.64	

## 11

2

[illegible]

TABLE I.—*Repaired*

Job No.	Location.	For whom done.	Grading.	Cement sidewalk.	Curb and set.
			<i>Cu. yds.</i>	<i>Sq. yds.</i>	<i>Lbs. ft.</i>
2079	Dupont circle and P street, abutting lot 2.	Geo. A. Fuller Co .....			
2080	Lots 46, 653, block 23, Columbia Heights..	Kennedy & Davis .....		108.48	
2081	714 Q street NW .....	Mrs. Sue Saunders .....		14.50	
2082	Southeast corner Eighth and Q streets NW.	Chas. Shreve .....		39.63	
2084	1505 Pennsylvania avenue NW .....	The Arlington Fire Ins. Co. ....		37.28	
2085	Northwest corner Twelfth street and Massachusetts avenue NW.	Hopewell Darnelle .....		269.69	
2086	1315 Connecticut avenue NW .....	Thos. S. Lee .....		35.49	
2087	South side W street, between Florida avenue and Tenth street.	E. Esber .....	3		
2088	Southeast corner Twentieth and P streets NW.	John C. Walker .....		83.71	18
2089	West side Q street NW, between Twenty-first and Twenty-second streets.	Leon E. Dessey .....		46.94	
2093	Southeast corner Twenty-first street and Massachusetts avenue NW.	Thos. F. Walsh .....	8	567.51	17
2095	1326 and 1328 H street NW .....	D. W. McGrath .....	2		
2096	Lot 17, block 7, Kalorama Heights .....	Philip Mauro .....	15		
2097	South side Thomas street, Moore and Barbour's addition.	James F. Barbour .....	25		3.40
2098	224 Twelfth street SW .....	John H. Nolan .....	2		
2100	Alley rear of lot 74, square 202 .....	Davidson & Davidson .....	16		
2101	Massachusetts avenue, front of lot 1, square 95.	Mrs. E. W. Westinghouse.	1.50	154.58	
2102	1329 to 1337 Harvard street NW .....	C. M. Campbell .....		67.63	
2103	West side Brown street, between Howard and Laurel.	N. E. Young .....			
2104	Alley adjacent to 117 S street NW .....	W. J. Leishear .....			
2105	Both sides Oakwood terrace, intersection of Piney Branch road and Howard avenue.	L. S. Lipscomb .....			
2107	912 to 922 and 928 Seventh street NW .....	M. Goldenberg .....		152.49	+240
2110	1922, 1924, 1926 I street NW .....	W. C. Hill .....		69.07	63
2111	Twelfth street SE, between K and L.	L. M. Hummer .....	5		
2112	South side U street NW, between First and Second.	Thos. M. Haislip .....			
2113	2010 Massachusetts avenue NW .....	Grace D. Litchfield .....		75.39	
2114	1229 Connecticut avenue NW .....	F. A. R. Jung .....		4.44	
2115	47, 49, 51 Florida avenue NW .....	James Robbins .....		40.48	
2116	1449, 1451, 1453 Sheridan avenue NW .....	C. W. King, jr .....			
2119	1216 G street NW .....	W. H. Germann .....			
2121	Hillyer street side, Twenty-first and Hillyer.	Duane E. Fox .....		21.52	
2122	Alley, square 109 .....	John H. Nolan .....	207		33.79
2124	Sheridan avenue between Sixteenth and Piney Branch road.	C. W. King, jr .....		52.56	
2127	Sheridan avenue, lot 476 .....	Chas. Schneider .....		93.08	
2128	West side Sixteenth street, front lots 228 and 229.	do .....		98.44	
2130	Alley entrance, square 289 .....	W. H. Germann .....			
2131	Queens Chapel road from Rhode Island avenue to Brentwood road.	E. F. Neimeyer .....			
2132	2746-2748 Fourteenth street NW .....	Ellen B. Foster .....		26.46	
2133	1424 Welling place .....	Louis Hartig .....		17.32	
2135	East side First street NW, from Q to alley north.	Harry L. Turner .....		74.47	
2136	638 Sixth street NE .....	Mrs. O. Warren .....		18.92	
2137	South side Sixteenth and east side Grant street NW.	Carl Hoffman .....		355.70	
2138	Northeast corner Thirteenth and Kenesaw.	Chas. E. Bancs .....		84.47	
2142	3514-3516 New Hampshire avenue NW .....	Victor Anderson .....		51.90	
2145	North side Grant street between old Sixteenth and new Sixteenth.	Mrs. M. J. Cranford .....		78.03	
2146	652 Sixth street NE .....	Fred. B. Williams .....		18.98	
2147	3104 Fourteenth street NW .....	J. B. Swaim .....		26.27	
2148	3483 Morgan avenue .....	D. W. Ballinger .....		13.54	
2149	802 B street NE .....	C. B. Hughes .....	4		
2150	3481 Morgan avenue .....	E. R. McComas .....		13.59	
2151	640 Sixth street NE .....	A. E. Huggins .....		19.17	
2152	East side Fifth street NW., Columbian University.	Chas. W. Holmes .....		187.48	
2153	Northwest corner of P and Kingman place.	Gasch Bros .....		76.32	56.1
2155	910 Seventh street NW .....	M. R. George .....		31.27	35
2156	642 Sixth street NE .....	A. N. McGhan .....		16.86	

## 13

**permit—Continued.**[illegible]

14      OPERATIONS OF THE ENGINEER DEPARTMENT, D. C.

TABLE I.—*Regular*

Job No.	Location.	For whom done.	Grading.	Cement sidewalk.	Curb re-set
			<i>Cu. yds.</i>	<i>Sq. yds.</i>	<i>Lin. ft.</i>
2159	East side Fifteenth street between P and Rhode Island avenue.	J. M. Schick .....		82.59	
2163	1609 First street NW .....	Cassius M. Buck .....		16.74	
2165	1521 New Hampshire avenue NW .....	Fred. Drew .....			
2172	1512 Grant street .....	E. A. Stephan .....			
2173	1514 Grant street .....	Anton Zichtl .....			
2174	2204 Decatur place .....	Moore & Hill .....		14.24	
2177	1516 Grant street .....	Ellen Rhodes .....			
2178	Alley, square 963 .....	James D. Burn .....			
2193	1918 I street, NW .....	A. P. Fardon .....		32.56	
	Total .....		5,929.50	6,698.07	1,324.79

*permit*—Continued.

Curb set.			Vitri- fied block paved.	As- phalt block paved.	Cob- ble.	Flag laid.	Flag relaid.	Brick side- walk paved.	Brick side- walk re- paved.	Gran- ite block.	As- phalt tile.	Cost.
6 by 20.	8 by 8.	Old.										
<i>Lin. ft.</i>	<i>Lin. ft.</i>	<i>Lin. ft.</i>	<i>Sq. yds.</i>	<i>Sq. yds.</i>	<i>Sq. yds.</i>	<i>Lin. ft.</i>	<i>Lin. ft.</i>	<i>Sq. yds.</i>	<i>Sq. yds.</i>	<i>Sq. yds.</i>	<i>Sq. yds.</i>	
.....	95.65	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	\$202.67
.....	25.23	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	18.28
40	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	28.47
40	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	89.80
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	89.80
25.22	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	17.65
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	24.68
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	205.27
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	85.57
3,068.07	4,380.58	381	300.47	3,164.50	107	.....	113	1,378.50	112	57.83	.....	26,438.25

TABLE K.—Assessment and

Job No.	Location.	Grading.	Cement side-walk.	Curb reset.	Curb set.		
					6 by 20.	8 by 8.	Old.
		<i>Cu. yds.</i>	<i>Sq. yds.</i>	<i>Lin. ft.</i>	<i>Lin. ft.</i>	<i>Lin. ft.</i>	<i>Lin. ft.</i>
3056	North side I street, between Twelfth and Thirteenth streets.....		411.33	4.60		431.00	
3057	West side Twenty-second street, between Q and Massachusetts avenue.....		113.62				
3058	Lot 153, U street, between Seventeenth and alley west.....		100.07				
3059	North side U street, between Sixteenth and Seventeenth streets NW.....	5	376.39				
3060	South side Q street NW., between Fifth and Sixth streets.....		118.76				
3061	Connecticut avenue, between Dupont circle and N street, and N street, between Connecticut avenue and Eighteenth street.....		410.06			335.50	
3062	East side Twenty-first street NW., between Q and R streets.....	5	207.30			122.24	4
3063	South side U street NW., between First and Second streets.....		224.23		134.71		
3065	West side Third street, between Rhode Island avenue and south end of existing walk.....	527	165.66			235.00	
3066	Both sides Columbia street NW., from O to Q streets.....					1,736.79	
3067	Both sides Kenesaw avenue, from Thirteenth street east.....	10				523.38	
3068	East side Thirty-second street NW., between Q and U, and west side, between R and U streets.....		1,818.70	15.00			
3077	North side Columbia road and Connecticut avenue extended, from Le Roy place to California avenue.....		388.47			297.06	
3078	West side Columbia road, from California avenue to Twentieth street extended, and from Nineteenth street extended to Baltimore street.....		844.46				
3079	East side Columbia road, from Florida avenue to Wyoming avenue.....	83	471.84	129		30.36	
3084	Both sides H street NE., from North Capitol to First street.....					1,660.28	
3087	North side Decatur place, between Twenty-second street and Florida avenue.....		400.62				
3089	Both sides Morton place NE., Sixth street to Seventh street.....		790.66	80	1,282.12		
3093	South side S street NW., from Twenty-second street to Phelps place.....		258.16	10		32	
3097	South side W street NW., between Tenth street and Florida avenue.....		230.09	35		234.50	
3099	West side Fourteenth street NW., between Columbia road and Kenesaw avenue.....		314.20				
3100	West side Fourteenth street NW., between Chapin street and Willing place.....		290.34				
3101	West side Fourteenth street NW., between Florida avenue and Staughton street.....		23.24				
3102	East side Fourteenth street NW., between Clifton and Roanoke.....		378.78				
3105	Both sides Connecticut avenue, between Cincinnati street and Cathedral avenue.....		2,941.09				
3106	Both sides Cincinnati street, between Connecticut avenue and bridge.....		578.32				
3109	Both sides Kenesaw avenue, between Fourteenth and Sixteenth streets NW.....	93		16	1,780		
3116	Both sides Sixteenth street NE., between Rosedale and Gales streets.....		314.84	50			
3117	East side Thirteenth street NW., between Harvard street and Columbia road.....		192.26		166.50		
3118	East side Second street SE., between M and N streets.....		652.89		672.40		
3120	East side Vermont avenue NW., between L and M streets.....		250.06	258			15
3121	North side I street NW., between Fourteenth and a point 40 feet west.....		50.61				
3123	North side New York avenue NW., between Fourteenth and H streets.....		367.26			212	

and permit work, 1903.

Vitrified block paved.	Asphalt block paved.	Cobble.	Asphalt tile relaid.	Flag laid.	Flag relaid.	Brick sidewalk laid.	Brick sidewalk relaid.	Granite block laid.	Gravel- ing.	Cost.
Sq. yds.	Sq. yds.	Sq. yds.	Sq. yds.	Lin. ft.	Lin. ft.	Sq. yds.	Sq. yds.	Sq. yds.	Sq. yds.	
		287						66	208	\$118.25
	427									266.85
	744									1,693.91
										12.25
		153								51.00
										1,177.11
										910.96
344		4						3		563.82
576										900.17
270										441.76
										172.70
73.60										98.98
										1,179.41
										740.96
										1,023.62
										297.27
										680.39
	235.20	9								1,055.22
	922									652.52
										1,509.91
										6.19
										722.12
										623.11
										458.30
										196.12
										439.99
										417.89
										300.11
										509.56
										623.91
										304.41
										801.50
20,426	27.50	8								4,071.92
	2,940									5,412.47
525										823.71
1,464										696.52
	1,805						28	3		2,563.32
1,507						47				6,941.51
	340									3,358.93
	1,732							71		548.76
										3,565.53
										275.19
										560.27

TABLE K.—Assessment and

Job No.	Location.	Grading.	Cement side-walk.	Curb reset.	Curb set.		
					6 by 20.	8 by 8.	Old.
		<i>Cu. yds.</i>	<i>Sq. yds.</i>	<i>Lin. ft.</i>	<i>Lin. ft.</i>	<i>Lin. ft.</i>	<i>Lin. ft.</i>
3056	North side I street, between Twelfth and Thirteenth streets.....		411.33	4.60	431.00		
3057	West side Twenty-second street, between Q and Massachusetts avenue.....		113.62				
3058	Lot 153, U street, between Seventeenth and alley west.....		100.07				
3059	North side U street, between Sixteenth and Seventeenth streets NW.	5	376.39				
3060	South side G street NW., between Fifth and Sixth streets.....		118.76				
3061	Connecticut avenue, between Dupont circle and N street, and N street, between Connecticut avenue and Eighteenth street.....		410.06			385.50	
3062	East side Twenty-first street NW., between Q and R streets.....	5	207.30			122.24	
3063	South side U street NW., between First and Second streets.....		224.23		134.71		
3065	West side Third street, between Rhode Island avenue and south end of existing walk.....	527	165.66			235.00	
3066	Both sides Columbia street NW., from O to Q streets.....					1,736.79	
3067	Both sides Kenesaw avenue, from Thirteenth street east.....	10				528.38	
3068	East side Thirty-second street NW., between Q and U, and west side, between R and U streets.....		1,818.70	15.00			
3077	North side Columbia road and Connecticut avenue extended, from Le Roy place to California avenue.....		388.47			297.06	
3078	West side Columbia road, from California avenue to Twentieth street extended, and from Nineteenth street extended to Baltimore street.....		844.46				
3079	East side Columbia road, from Florida avenue to Wyoming avenue.....	83	471.84	129		30.36	
3084	Both sides H street NE., from North Capitol to First street.....					1,660.28	
3087	North side Decatur place, between Twenty-second street and Florida avenue.....		400.62				
3089	Both sides Morton place NE., Sixth street to Seventh street.....		790.66	80	1,282.12		
3093	South side S street NW., from Twenty-second street to Phelps place.....		258.16	10		32	
3097	South side W street NW., between Tenth street and Florida avenue.....		230.09	35		234.50	
3099	West side Fourteenth street NW., between Columbia road and Kenesaw avenue.....		314.20				
3100	West side Fourteenth street NW., between Chapin street and Willing place.....		290.34				
3101	West side Fourteenth street NW., between Florida avenue and Staughton street.....		23.24				
3102	East side Fourteenth street NW., between Clifton and Roanoke.....		378.78				
3105	Both sides Connecticut avenue, between Cincinnati street and Cathedral avenue.....		2,941.09				
3106	Both sides Cincinnati street, between Connecticut avenue and bridge.....		578.32				
3109	Both sides Kenesaw avenue, between Fourteenth and Sixteenth streets NW.....	93		16	1,780		
3116	Both sides Sixteenth street NE., between Rosedale and Gales streets.....		314.84	50			
3117	East side Thirteenth street NW., between Harvard street and Columbia road.....		192.26		166.50		
3118	East side Second street SE., between M and N streets.....		652.89		672.40		
3120	East side Vermont avenue NW., between L and M streets.....		250.06	258			
3121	North side I street NW., between Fourteenth and a point 40 feet west.....		50.61				
3123	North side New York avenue NW., between Fourteenth and H streets.....		367.26			212	

## 19

[illegible]

TABLE K.—Assessment and

Job No.	Location.	Grading.	Cement side-walk.	Curb reset.	Curb set.		
					6 by 20.	8 by 8.	Old.
		Cu. yds.	Sq. yds.	Lin. ft.	Lin. ft.	Lin. ft.	Lin. ft.
8124	North side Seaton street NE., between North Capitol and Lincoln avenue.		224.76		290.50		
8125	East side Eighth street SE., from D to G streets, from I to K, and Virginia avenue to L, and west side Eighth, from D to E streets.			158.62		1,791.28	84.50
8126	Alleys, block 7, Bloomingdale.	883		10			28
8127	Alley in square 408.	17					
8130	Alley, square 920.		69.92				
8131	East side Seventh street, between Keokuk and Lowell.						
8134	Alley, block 5, Dobbins's addition.	95		30	18.41		
8135	Alley, blocks 1 and 2, addition to Le Droit Park.						
8136	Alley, square 288.		87.38				
2139	South side R street NW., between Twenty-second and Sheridan circle.		326.44		291		
8141	North side Philadelphia street, between Brightwood avenue and Eighth.						
8144	East side Twelfth street, between I and Georgia avenue SE.						241
8145	East side Twelfth street, between K and L streets SE.				108.21		
8146	South side Georgia avenue, between Eleventh and Twelfth streets SE.	15			166.41		
8151	South side Massachusetts avenue, between Twentieth and Twenty-first streets NW.		40.75				
8154	Alley, square 674.						
8163	Alley, square 111.						
8164	Alley, block 3, Bloomingdale.						
8165	North side B street NE., between Delaware avenue and First street.		523.62	610			22
8168	South side Columbia road, between Eighteenth and Champlain avenue, and north side Columbia road between Adams Mill road and lot 201.		397.41				
8169	E street, between Eighteenth and Nineteenth streets SE.						26
8172	North side New York avenue NW., between Twentieth street and Virginia avenue.		298.23				
8174	East side Corcoran street, between Olivet and Gallaudet streets.	259					
8175	North side Olivet street, between Corcoran street and Capitol avenue.	98					
8176	North side Olivet street, between Capitol avenue and B. & O. R. R.	48					8
8177	South side Mount Olivet road, between B. & O. R. R. and Twelfth street.	68					8
8179	Both sides Eighth street NW., between Grant and Sheridan avenues.	194		204			
8194	South side Sheridan street west of Fourteenth street NW.		310.18			524.24	
	Total.	11,965	23,190.07	4,616.46	5,316.98	9,995.68	591

*permit work, 1903—Continued.*

Vitrified block paved.	Asphalt block paved.	Cobble.	Asphalt tile relaid.	Flag laid.	Flag relaid.	Brick sidewalk laid.	Brick sidewalk relaid.	Granite block laid.	Gravel- ing.	Cost.
Sq. yds.	Sq. yds.	Sq. yds.	Sq. yds.	Lin. ft.	Lin. ft.	Sq. yds.	Sq. yds.	Sq. yds.	Sq. yds.	
										\$611.38
										2,260.99
1,839		9					9			3,114.62
171										384.63
										95.45
										61.20
497										837.41
										58.54
										119.21
										504.26
										42.63
										73.29
										124.33
										181.71
										44.50
										1,487.68
36.06										584.99
										72.06
										721.80
										419.34
12.50						257	17			261.77
										334.04
						304				850.53
					38	122				149.82
				14		53				81.63
						101				117.35
		18		20		567				526.64
										925.18
27,747.16	9,232.70	525		34	38	1,469	75	143	208	86,146.60

TABLE L.—*Sidewalk*

Job No.	Location.	Grading.	Cement sidewalk.	Curb and rest.
		<i>Cu. yds.</i>	<i>Sq. yds.</i>	<i>Lin. ft.</i>
2500	North side Pennsylvania avenue, from Madison place, east square 221 .....		436.94	2
2501	East side Seventh street NW., abutting Manual Training School, and south side Rhode Island avenue, between Seventh street and alley east .....		307.95	
2502	North side South Carolina avenue and east side Second street, abutting Dent School .....		469.51	40.00
2503	South side Pennsylvania avenue, between Ninth and Tenth, abutting Marine Hospital .....		426.31	11
2506	West side Fifteenth street and east side Kentucky avenue, reservation 263 .....		128.01	
2507	Schoolhouse, Philadelphia street, Petworth .....		94.63	
2508	Brightwood school, Brightwood avenue NW .....	54		
2509	Vermont avenue, Tenth and U streets NW, reservation 170 .....	90		8
2510	Twenty-first, New York and Virginia avenue, reservation 106 .....	325		
2513	West side Thirty-second street, north of lot 208, square 1279, and east side Thirty-second street north of lots 31 to 36, square 1280 .....		705.49	
2518	New Public Library, K street, between Seventh and Ninth streets .....	450	843.10	56.4
2520	North side New York avenue, between Fourteenth and H streets, reservation 172 .....		214.06	
2523	North Capitol street side old Government Printing Office .....			110
2525	South side North Carolina avenue NE., between No. 8 engine house and stables .....		36.45	39.14
2526	Eighth street SE., between Pennsylvania avenue and L street .....			
2528	Reservations 252 and 253, between Eleventh and Twelfth, K and Georgia avenue SE. ....			72.34
	Total .....	919	3,662.53	339.6

*and curb, 1903.*

Curb set.			Asphalt tile paved.	Vitrified tile paved.	Asphalt block roadway.	Brick sidewalk laid.	Brick sidewalk relaid.	Flag re- laid.	Cost.
6 by 20.	8 by 8.	Old.							
<i>Lin. ft.</i>	<i>Lin. ft.</i>	<i>Lin. ft.</i>	<i>Sq. yds.</i>	<i>Sq. yds.</i>	<i>Sq. yds.</i>	<i>Sq. yds.</i>	<i>Sq. yds.</i>	<i>Lin. ft.</i>	
.....	242.20	.....	.....	.....	.....	.....	.....	.....	\$725.00
.....	107.28	95	.....	.....	.....	.....	.....	.....	487.40
150.40	.....	.....	.....	.....	.....	.....	.....	.....	674.81
.....	327.59	.....	.....	.....	.....	.....	.....	.....	810.66
.....	184.40	.....	.....	.....	.....	.....	.....	.....	328.24
.....	.....	.....	125	.....	12	.....	.....	.....	106.04
.....	251.60	.....	230	.....	.....	.....	.....	.....	118.48
.....	.....	.....	.....	412	.....	.....	.....	.....	358.92
.....	.....	.....	.....	.....	.....	.....	.....	.....	227.62
.....	569.89	.....	.....	.....	.....	.....	.....	.....	753.61
.....	.....	.....	.....	.....	.....	.....	.....	.....	1,861.12
.....	223	.....	.....	.....	.....	.....	.....	.....	478.45
.....	229.84	.....	.....	.....	.....	806	.....	.....	558.16
.....	.....	.....	.....	.....	.....	.....	.....	.....	43.78
.....	.....	.....	.....	.....	.....	.....	.....	.....	878.90
.....	.....	699.50	.....	.....	.....	.....	.....	157	252.25
150.40	2,135.80	794.50	355	412	12	806	.....	157	8,657.44





TABLE N.—Whole cost work, 1903.

Job No.	Location.	Depositors.	Curb set, 8 by 8.	Cement.	Granite block roadway.	Cost.
			<i>Lin. ft.</i>	<i>Sq. yds.</i>	<i>Sq. yds.</i>	
6007	North side G street NW., lots A and B, and south side Pennsylvania avenue, lot A.	Geo. N. Fuller & Co .....				\$101.00
6016	Eleventh street front, corner Eleventh and G streets NW.	Woodward & Lothrop .....				32.75
6026	Repairs to iron column, Eighth and E streets NW.	John S. Newbold .....				2.00
6027	Entrance to 1717 Twentieth street NW.	Franklin T. Sanner .....				11.72
6031	National Roller and Ball Bearing Co., Thirty-third and K NW.	National Roller and Ball Bearing Co. ....			8	2.00
6032	West side Arthur place, front lot 41.	W. E. Speir .....				24.77
6035	Repairs to Anacostia Bridge .....	Standard Oil Co. ....				16.00
6043	Alley abutting lot 104, square 210.	J. M. Schick .....	123.90	55.99		181.07
6042	Alley, square 250 .....	John McGregor .....				23.31
	Total .....		123.90	55.99	8	416.71

TABLE O.—Number of square yards and cost charged for repairs to cuts made by plumbers and others in streets, avenues, and alleys during the fiscal year ended June 30, 1903.

Item No. 1 shows the number of cuts repaired for various plumbers.

Item No. 2 shows the number of cuts repaired and the cost thereof on "whole cost" work, to which 5 per cent is added for tools, clerk hire, etc., for the maintenance of the whole cost deposit fund, which fund is used to pay all accounts for labor, material, tools, etc., used in this class of work, and also includes the work done for gas, electric-light, and telephone companies, which is charged at other than the flat rates charged to plumbers.

Item No. 3 shows the number of cuts repaired on account of the sewer department and the cost of the same.

Item No. 4 shows the number of cuts repaired on account of the water department and the cost of the same.

Item No. 5 shows the number of cuts repaired and work done on account of other appropriations of the District and the cost of the same; also the cost of work charged against retents and appropriations of the General Government.

	Number.	Square yards.	Cost (amount charged).
Item No. 1.—Plumbers' cuts:			
Sheet asphalt .....	254	549.30	\$1,647.90
Granite block .....	67	146	207.10
Asphalt block .....	258	644.75	870.01
Vitrified block or brick .....	169	361	722.00
Cobblestone and rubble .....	203	506.20	227.79
Macadam .....	114	181	241.25
Granolithic .....	134	277.20	623.70
Brick sidewalks .....	979	11,183.43	4,151.25
	2,178	13,848.88	8,494.01
Item No. 2.—Railroad, electric-light companies, gas company, telephone company, and other whole cost work.	1,507	46,646.32	60,663.40
Item No. 3.—Various appropriations of the sewer department.	296	2,216.20	4,567.61
Item No. 4.—Various appropriations of the water department.	414	9,347.60	14,313.75
Item No. 5.—Various appropriations other than the above, including repairs to streets and roads, street lighting, electric department, improvements and repairs, assessment and permit work, etc.	351	12,949.20	15,145.31
Total .....	4,746	85,108.20	106,323.08

TABLE P.—Grading streets, alleys, and roads, 1903.

Job No.	Location.	Gravel.	Grading.	Cost.
		<i>Sq. yards.</i>	<i>Cu. yards.</i>	
1901	Madison street west of Thirty-fifth street .....		436	\$52.75
1902	D street NE. between Fourteenth and Fifteenth streets .....		515	71.27
1904	A street SE. between Seventeenth and Eighteenth streets .....	8.55	290	105.00
1905	A street SE. between Fifteenth and Seventeenth streets .....	1,777	782	176.75
1906	Sherman avenue and Columbia road .....		337	52.00
1907	Corner Sherman and Whitney avenues .....		305	68.00
1908	Thirtieth street, White Croft's subdivision .....		1,316	213.25

TABLE P.—Grading streets, alleys, and roads, 1903—Continued.

Job No.	Location.	Gravel.	Grading.	Cost.
		<i>Sq. yards.</i>	<i>Cu. yards.</i>	
1909	Swann street between Sixteenth and Seventeenth streets .....	624		\$117.80
1910	Dover street between Twelfth and Fourteenth streets .....	913		92.80
1912	D street between Fifteenth and Sixteenth streets SE.....	504		53.25
1913	Lanier avenue between Adams Mill road, 200 feet east of Ontario..	580		63.00
1914	N street NE. between Twelfth street and Trinidad avenue .....	8,684		1,471.19
1915	Rhode Island avenue NE. between North Capitol street and Lincoln avenue .....	2,150		272.37
1917	L street SE. between Eleventh and Thirteenth streets .....	2,942		360.75
1919	Duncan street NE. Fourteenth to Fifteenth streets .....	4,690		782.50
1922	Propagating garden .....	600		45.00
1923	North side Massachusetts avenue from Woodley Inn to Joliet street.	156		31.50
1926	Eckington place between Florida avenue and Q street.....	7,524		817.95
	Total .....	1,785.55	33,260	4,850.23

## REPORT OF THE SUPERINTENDENT OF STREETS.

WASHINGTON, D. C., July 1, 1903.

SIR: I have the honor to submit herewith the annual report of the operations under my charge for the fiscal year ended June 30, 1903.

Table H is a summary of work done (by day labor, except cement sidewalks, which work was executed by contract) under the appropriation for "Current repairs to streets, avenues, and alleys." The cost of this work was \$28,588.52, including the repairs to 2,872 dangerous holes. Of this amount, about one-third was sidewalk and alley work and the other two-thirds repairs to street roadways.

Table I is a list of work done under the permit system, by which the property owners requested the improvements and paid one-half the cost, the District paying the other half. Total, \$26,438.25.

Table K is a list of the work done under the assessment system. One-half the cost of work done under this system is charged against the abutting property. The total cost of such work was \$86,146.60.

Table L is a list of work paid for from the appropriation for "Replacing sidewalks and curbs around public reservations and municipal buildings." The amount expended under this head was \$8,657.44.

Table N is a list of work done in public space for private parties, for which they paid the entire cost. Deposit to cover the estimated cost of the work is required in advance of the work being done. This work amounted to \$416.72.

H. N. MOSS,  
*Superintendent of Streets.*

The ENGINEER OF HIGHWAYS, DISTRICT OF COLUMBIA.

Respectfully transmitted to the Engineer Commissioner, District of Columbia, through Capt. H. C. Newcomer.

C. B. HUNT,  
*Engineer of Highways, D. C.*

## REPORT OF THE SUPERINTENDENT OF COUNTY ROADS.

WASHINGTON, October 6, 1903.

Mr. C. B. HUNT,  
*Engineer of Highways.*

SIR: I have the honor to submit report of the operations of the county road division during the fiscal year ended June 30, 1903.

I desire to invite attention to the fact that the amount of funds heretofore appropriated for repairs to roads is quite inadequate to keep the roads in proper repair, and I wish to strongly recommend that \$150,000 be asked of Congress for this purpose.

The mileage to be covered by these funds is, outside of paved portions, as follows:

	Miles.
Macadam .....	55.73
Gravel.....	71.21
Unimproved .....	60.13

187.07

Very respectfully,

MORRIS HACKER,  
*Superintendent of Roads.*

*Expenditures for repairing county roads and suburban streets, fiscal year 1902-3.*

Job No.	Location.	Cost.
SECTION I.		
4010	Connecticut avenue .....	\$200.81
4023	Tennallytown road .....	8,180.68
4025	Military road .....	394.25
4026	American University .....	448.00
4045	Rock Creek Ford road .....	796.00
4064	River road .....	103.00
4072	Broad Branch road .....	620.87
4088	Tunlaw road .....	196.34
4106	Massachusetts avenue, between Joliet and Richmond .....	5.75
4180	Tunlaw road, south of Nebraska avenue .....	622.49
Dangerous holes and minor repairs .....		11,494.88
Total .....		6,628.30
Total .....		18,123.18
SECTION II.		
4006	U street, from 1st street NW. west .....	191.28
4008	Brightwood avenue .....	3,280.29
4011	Thirteenth street, Whitecroft's subdivision .....	44.00
4012	Sherman avenue and Columbia road .....	11.50
4013	Sherman avenue and Whitney avenue .....	17.25
4021	Staughton street .....	122.87
4028	Sheridan street, between Brightwood and Sherman avenues .....	155.11
4029	Fourth street, T to Elm .....	905.08
4030	Ninth street, between Erie and Flint .....	658.37
4081	Pomerooy street, between Fourth street and Morris Lane .....	1,564.71
4044	Ingraham street, between Brightwood and Colorado avenues .....	1,428.90
4055	Erie street, between Messmore and Sixteenth .....	323.88
4057	Whitney avenue, between Sherman and Brightwood .....	1,406.39
4059	V street, between First and North Capitol .....	396.16
4060	Blagden avenue .....	1,263.23
4073	T street, between First west and Lincoln avenue .....	241.50
4076	Twenty-second street, between R and Decatur .....	370.93
4077	Bismarck street, between Brightwood avenue and Sherman .....	128.29
4087	Rhode Island avenue, between North Capitol and Lincoln .....	73.00
4096	V, W, and Albany streets .....	475.11
4097	Sheridan avenue, Fourteenth to Sixteenth street .....	54.60
4098	Harwood road .....	57.62
4108	Lanier avenue .....	21.25
4109	Fern street .....	169.92
4130	Brown street, Howard avenue to Sheridan .....	183.31
4042	Bunker Hill road, Fourth street east to Baltimore and Ohio Railroad .....	61.75
4148	Central avenue, north of Erie .....	30.00
4149	North Capitol and T streets .....	30.00
4150	East side Fourteenth street, across Whitney avenue .....	30.75
4169	Kenesaw avenue, Fourteenth street and old Sixteenth street .....	2,110.64
4178	Thirteenth street, between Whitney and Lydecker .....	106.75
4187	Sherman avenue .....	3,338.89
4213	Eckington place, between Florida avenue and Q street .....	132.06
Dangerous holes and minor repairs .....		20,315.31
Total .....		10,784.36
Total .....		31,097.67
SECTION III.		
4009	Bunker Hill road .....	1,971.75
4022	Ninth street, between Providence street and Bunker Hill road .....	157.63
4024	Queen's Chapel road .....	128.25
4027	Rosedale street .....	280.11
4032	Dover street, Brookland, between Twelfth and Fourteenth .....	23.79
4041	Montgomery street .....	64.89
4058	Kramer street, Sixteenth to Seventeenth street .....	1,279.87
4075	Brentwood road .....	128.00
4085	Twenty-fourth street, Langdon, between Cincinnati and Detroit .....	562.71
4086	Cincinnati street, between Twenty-second and Twenty-fourth .....	1,328.54
4107	N street NE., between Twelfth street and Trinidad avenue .....	566.32
4179	Twelfth street, between Frankfort and Dover .....	2,250.80
4198	Carroll avenue, Blair road to District of Columbia line .....	2,089.45
4205	Detroit street, Twelfth to Thirteenth .....	776.00
Dangerous holes and minor repairs .....		11,736.65
Total .....		6,432.80
Total .....		18,169.45
SECTION IV.		
4043	Morris street .....	603.80
4062	Good Hope road .....	42.00
4117	Nichols avenue .....	45.25

# OPERATIONS OF THE ENGINEER DEPARTMENT, D. C. 29

*Expenditures for repairing county roads and suburban streets, fiscal year 1902-3—Cont'd.*

Job No.	Location.	Cost.
SECTION IV—continued.		
4142	Ridge road.....	\$235.93
4219	Bennings road.....	1,617.70
	Dangerous holes and minor repairs.....	2,550.68
	Total.....	4,581.32
		7,182.00

## RECAPITULATION.

Section I.....	\$18,121.18
Section II.....	31,099.67
Section III.....	18,169.45
Section IV.....	7,182.00
Total.....	74,522.30
Salaries.....	3,956.72
Hire of horse and buggy.....	361.00
Blacksmithing.....	444.05
Purchase of tools.....	190.85
Breaking stone and miscellaneous labor.....	510.33
Material purchased for general use.....	14.75
Total.....	80,000.00

Appropriation, \$80,000.

*Statement showing number of per diem employees, other than day laborers, surface division, employed upon regular and continuous work for thirty days or more, and appropriations from which paid, during the fiscal year ended June 30, 1903.*

Designation.	Number.	Rate.
Assistant engineers.....	2	One at \$6 and one at \$4.
Engineer of bridges.....	1	\$125 and \$175. <sup>a</sup>
Transitmen.....	2	\$4.
Rodmen.....	3	\$3.
Chainmen.....	3	\$2.25.
Draftsmen.....	2	One at \$4.50 and one at \$3.50.
Clerks.....	3	\$4.50. <sup>b</sup>
Do.....	5	\$4. <sup>c</sup>
Do.....	1	\$3.25 and \$3.50. <sup>c</sup>
Do.....	1	\$3.50.
Inspectors.....	1	\$5.
Do.....	16	\$4.
Do.....	1	\$3.50.
Do.....	1	\$2.
Foremen.....	11	\$4.
Subforemen.....	3	\$3.
Rollermen.....	3	\$3.50.
Plumbers.....	1	\$3.50.
Bridgekeepers.....	4	\$50. <sup>a</sup>
Messengers.....	1	\$1.75.
Do.....	1	\$1.50.
Superintendent of stables.....	1	\$5. <sup>d</sup>
Hostlers.....	1	\$1.75.
Drivers.....	2	\$1.75.
Do.....	5	\$1.50 and \$1.75.
Do.....	1	\$1.50.

<sup>a</sup> Rate per month.

<sup>b</sup> One clerk at \$4.50, 1 at \$4, and 1 at \$3.50, paid from surface appropriations for four and one-half months of the year.

<sup>c</sup> Two clerks, at \$4, paid from surface appropriations for four months of the year.

<sup>d</sup> One superintendent of stables paid from surface appropriations for four months of the year.

## *Appropriations from which paid.*

Improvements and repairs, 1903.....	\$54,742.64
Improvements and repairs, 1902.....	516.93
Bathing beach.....	134.22
James Creek Canal (fencing).....	106.89
Extension of streets and avenues (Sixteenth street).....	318.50
Extension high service system.....	42.78
Emergency fund.....	5.95
Miscellaneous deposits.....	896.33
Deposit and assessment fund.....	3,441.75
Grand total.....	59,706.89

## REPORT OF THE ENGINEER OF BRIDGES.

WASHINGTON, D. C., *July 1, 1903.*

SIR: I have the honor to submit the following report for the fiscal year ended June 30, 1903:

The expenditures under "Ordinary care of bridges" were as follows:

Amount of appropriation.....	\$4,000.00
Salaries.....	3,955.71
Coal, oil, and contingencies.....	18.20
Paint purchased.....	23.00
Balance.....	3.09
	<hr/> 4,000.00

Keepers were stationed at the Aqueduct Bridge across the Potomac; Pennsylvania and Navy-Yard bridges across the Eastern Branch, and an inspector of bridges was employed to examine all bridges from time to time.

The work of "Construction and repairs" is shown by the annexed table.

All structures, excepting the Anacostia Bridge, are in safe condition, requiring only such repairs as are due to their use.

In reference to the Anacostia Bridge I have to state that it has been structurally weak for fifteen years, and since the employment of the heavy motor cars of the Anacostia and Potomac River Railway Company it is particularly so.

A careful determination of the stresses in the bridge under the existing condition and according to modern bridge practice clearly shows that the bridge is stressed throughout 100 per cent in excess of good practice, and that the hanger posts in many cases are stressed within a few per cent of their ultimate strength.

The importance of the immediate renewal of this bridge is further accentuated by the fact that one of the eyebars, which makes up the end hanger post on the downstream truss of the first span reckoning from the Washington side, broke in the weld, and I am of the opinion that if the truss had not been trestled at that time a serious accident might have occurred.

That this bridge is going to pieces under its excessive live load is further demonstrated by the fact that within the last year there have been two counter rods and one shoe broken.

In consequence of the unsafe condition of the bridge, and on account of the fact that it is much too narrow—the entire width of roadway being taken up with car tracks—and totally inadequate to meet the demands of public travel, I have to most urgently recommend that it be replaced at once with a modern structure.

From a cursory glance at the accompanying tabulation it is apparent that the appropriation of \$15,000 is not sufficient to repair the existing bridges. We find it necessary to delay repairs to the floors of all bridges until such time as they are approaching the danger limit.

A bridge floor should never be as rough as the paved roadways which approach it. Considerable complaint is lodged at this office on account of the excessive roughness which obtains at several of our bridges. Persons driving across them experience much discomfort and are practically forced to walk their horses drawing carriages and other light vehicles. The most serious point at issue, however, is the injury to the superstructure, which necessarily suffers on account of the heavy vibratory strains induced by the passage of heavy vehicles over the rough surface.

Attention is called to the police regulation which reads in part, "That no vehicle and its load which exceeds 6 tons shall be permitted to cross any bridge without a permit in writing from the engineer commissioner." This regulation is essential under the existing conditions. But it appears that in the case of bridges on main thoroughfares, where heavy loads frequently cross in excess of that permitted by the regulations, such as the Rock Creek bridges on the line of M and P streets, the roadways should be amply strong to carry the heavier loads. The substructure and superstructure of the bridges are ample to carry a buckle-plate asphalt floor and to permit loads up to 15 tons to cross in safety. It appears poor economy to have the aforesaid bridges, which cost approximately \$100,000 each, with floors so structurally weak that one-half the value of the bridges is lost to the public use. The estimated cost of a first-class floor for the P street bridge is \$4,000 and of the M street bridge \$5,500. Both estimates include the roadway between rails, also the sidewalks.

K street bridge, crossing Rock Creek, is structurally weak and will not permit of strengthening, but should be rebuilt as soon as possible. The estimated cost of reconstructing the K street bridge is \$20,000.

The three bridges which connect the city proper with Georgetown are deemed particularly important on account of the constantly increasing heavy travel from the water front. The cost of maintaining a concrete asphalt roadway and cement walks on the P street bridge is estimated at \$35 per annum and that of the present wooden ones at \$150 per annum. The cost of maintaining a concrete asphalt roadway and cement walks on the M street bridge is estimated at \$42 and that of the present wooden one at \$235.

I have to report that Massachusetts avenue bridge grading has been completed, and that the balance of the work to be done in order to finish the bridge consists of paving the roadway, planting vines on the slope, and constructing a fence along the top of the fill.

The cost of the bridge to date, exclusive of engineering and inspection, etc., is as follows:

Masonry work under contract No. 2626 .....	\$20, 248. 76
Masonry work under contract No. 2787 .....	111, 757. 06
Grading under contract No. 3052 .....	67, 779. 42
Total .....	199, 785. 24

In order that the grade of Massachusetts avenue between Rock Creek and Observatory circle might be raised, Congress appropriated \$10,000 additional to that previously appropriated to complete the bridge, and the bridge and the trustees of the Normanstone tract of land, lying on either side of the avenue between the aforesaid limits, deposited with the collector of taxes \$15,400 to be expended by the Commissioners for a similar purpose, it being stipulated that said \$15,400 should be used in grading the property of said trustees and the material deposited in public space. The entire amount of \$15,400 has been expended. The balance available for the completion of Massachusetts avenue bridge is \$18,500.

I have to suggest that an appropriation of \$100,000 be urged to immediately begin the reconstruction of the Anacostia Bridge, with the authority to contract for the completed structure at a cost of \$300,000, and that an appropriation of \$25,000 be requested for the construction and repair of bridges, instead of \$15,000, as heretofore provided.

It is thought that \$300,000 should be appropriated for continuing the construction of Connecticut avenue bridge, in order that the bridge can be completed within the time limit fixed by Congress.

It is further recommended that \$20,000 be asked for the reconstruction of the K street bridge across Rock Creek.

W. J. DOUGLAS,  
*Engineer of Bridges, District of Columbia.*

The ENGINEER OF HIGHWAYS, DISTRICT OF COLUMBIA.

Respectfully transmitted to the Engineer Commissioner, District of Columbia, through Capt. H. C. Newcomer.

C. B. HUNT,  
*Engineer of Highways, District of Columbia.*

*Expenditures, construction and repairs to bridges, 1903.*

Job No.	Bridge.	Character of work.	Cost.
3500		Various bridges .....	\$39. 73
3501	1	Chain Bridge, paint.....	917. 10
3504	24	Lay new floor and joists.....	137. 18
3505	38	do .....	346. 39
3507	36	Lay new floor and joists, north roadway .....	315. 68
3508	49	Lay new floor .....	109. 97
3509		M street bridge, new floor on south roadway .....	299. 82
3510	34	P street bridge across Rock Creek, new floor.....	343. 01
3512		Various bridges .....	6. 00
3513		Remove bridge Eighth and D and erect across Rock Creek.....	273. 24
3514		Various bridges .....	29. 93
3516		do .....	27. 93
3517		M street bridge across Rock Creek, repairs.....	226. 63
3518		Various bridges .....	130. 03
3519		do .....	128. 17
3521		do .....	19. 50
3522	30	Cincinnati street across Rock Creek, repairs .....	1. 81
3523	34	P street across Rock Creek, repairs.....	9. 00
3524		Various bridges .....	7. 87

*Expenditures, construction and repairs to bridges, 1903—Continued.*

Job No.	Bridge.	Character of work.	Cost.
3525		Kenesaw avenue, north Quarry Road, culvert	\$294.47
3526		Various bridges	1.00
3527		do	35.28
3528		do	4.00
3529	54	Pennsylvania avenue bridge, new floor and joists	3,506.77
3530		Various bridges	3.50
3531		do	7.25
3533		Pennsylvania avenue bridge southeast, repairing water pipe	3.50
3534		Various bridges	68.30
3535	78	Rebuild	114.75
3536		Various bridges	32.82
3537		do	41.00
3538		do	42.02
3539	Culvert 400.	Repair face wall on line Queen's Chapel road	111.40
3540		Various bridges	28.10
3541		do	40.65
3542		do	35.88
3545		do	120.15
		Lumber purchased for Aqueduct floor, to be laid under appropriation 1904	7,742.34
		Steel purchased for railing, to be laid under appropriation 1904	4,632.30
		Salaries, inspection, etc	508.10
			2,096.00
		Balance on hand	14,977.65
		Total	22.55
			15,000.00

## REPORT OF THE SURVEYOR.

WASHINGTON, D. C., August 31, 1903.

SIR: I have the honor to submit the following report of the operations of this office for the fiscal year ending June 30, 1903.

The principal items of work follow in tabular form, to afford ready comparison with the work of previous years.

*For private parties.*

Individual lots surveyed	1,223
Certificates of survey issued, covering one or more lots	1,022
Duplicates of above recorded in survey certificate books	1,022
Separate surveys made to verify walls	534
Individual buildings inspected as to location of new walls	888
Large tracts in county surveyed, subdivided, and recorded	9
Outline surveys in county of unsubdivided tracts	40
Subdivision blanks prepared <sup>a</sup>	465
Duplicate subdivision blanks prepared for assessor <sup>a</sup>	465
Plats of one or more recorded lots to accompany applications for building permits	915
Plats of entire blocks, or parts of blocks, preliminary to surveys	890
Miscellaneous plats, large and small	45
Estimates of cost, issued in triplicate	1,500
Total of plats for private parties	3,802
Total of fees paid to collector of taxes by private parties	\$8,865

*For the District of Columbia.*

Certificates of survey of one or more lots or parcels	45
Duplicates of above recorded	45
Plats recorded	11
Indorsements made on engineer department communications	700

<sup>a</sup> As many as possible of these subdivisions have been recorded in the books, but not all, it being necessary to deplete the drafting force to strengthen the field force. On the close of the heavy part of the building season these plats will be recorded, several hundred being still unfinished.

Indorsements on survey plats .....	1,022
Indorsements on wall-survey plats .....	534
Reports on various subjects, in letter form .....	244
Plats to accompany reports .....	41
Duplicates of above .....	41
Entries in letter-press book .....	1,895
Survey points secured by reference to permanent benches .....	60
Total of plats for District of Columbia .....	1,629

*Miscellaneous.*

Letters to engineer department and private parties .....	417
Telephone calls made and answered, about .....	4,600
Total of surveys, public and private .....	1,601
Total of plats, public and private .....	5,431
Entries of all sorts in order book .....	2,366

From one-third to one-half of the time of the clerks in public-record room taken up in answering questions and giving information to the public.

The above table shows increases over last year as follows: Four hundred and forty-five more surveys, or about 38 per cent, due to the demand for verification of walls during a very heavy building season, so heavy being the demand as to make imperative, from July 1 last (on the new fiscal year,) the performance of this duty by one particular field party, organized in addition to the regular field force.

The working of this party for the month of July past shows conclusively the propriety of this improvement. This party should consist of an inspector and two assistants, with first-class transportation, at least for the busier part of the building season, the present arrangement, with one assistant and the utterly unsatisfactory and expensive use of street cars, being a mere makeshift; but even so, a very great relief to the over-burdened field force and a means of securing wall verification within the limited time which the nature of the work allows. When mechanics are lost by contractors because of delays caused by this office, the wall-verification regulation does perhaps as much harm as good. I have every reason now to regard the regulation as a valuable one, and its entire success as dependent on proper facilities in this office for prompt attention to all demands that may be made. No case should stand unanswered for over twenty-four hours. The good effect is obvious in the security now obtained by owners, architects, and contractors, the revision of the work of masons, bricklayers, and carpenters constituting practically a form of insurance. The fee charged for this service (\$1 per building) is now a nominal one, and does not meet the expense of the field and office work involved. The necessity for this verification is seen in the very large number of cases where walls are found to be beyond the limit of allowed error, and are encroaching either upon public highways or upon a neighbor's land. No authority is assumed by this office to order removal of an erroneous wall or even the stoppage of work thereon, the policy being in all cases to simply report the situation, as found, at once to the building inspector, at the same time of course informing the superintendent of construction on the ground of the amount of error, and that unless change be made to true lines no certificate as to accuracy will be made.

In practice no difficulty is experienced, mechanics almost invariably at once accepting the situation and voluntarily and cheerfully correcting errors. In fact, the Washington mechanics show a strong tendency to take a pride in their "lay-out" of the walls of a building or a block, and the improvement in this kind of work is very noticeable since the institution of the system. Difficulties would be greatly eliminated from this inspection work, and chances of error on the part of builders would be greatly reduced were a rule in force as to party walls, requiring walls purporting to be party walls to be centered upon division lines between lots, the amount of land taken from a lot adjoining the one built upon of course never exceeding the 9 inches allowed in the case of an 18-inch wall. The alternative would then be presented in very simple form, of centering upon the line or keeping the outer face within the lot or flush with the line. This is a matter out of the province of this office, of course, and one for the consideration of the building inspector and the Commissioners exclusively.

I merely state facts as developed by this new system, which shows many instances of outer or end walls of blocks of buildings to be neither one thing nor the other, i. e., neither centered on division lines nor wholly within the outer lot-line, and consequently diminishing the available space of the adjoining lot without providing the complete half wall apparently contemplated by the building regulation established under the authority of the first President, payment for use of which is pro-

vided for in subsequent legislation. Failure to center on the line compels naturally a readjustment of the division line by purchase or agreement or the placing of a building on parts of two lots, which causes much needless confusion in transfers of title, and in the records of the assessor's office, and needless expense to one or both of the adjoining owners, caused by surveys found absolutely essential to determine where the centers of such end walls actually are.

Pending any changes of regulations in this particular this office is securing and recording, in the ordinary course of wall inspection, the relation to the nearest lot lines of the centers of such end walls, as have been built since March 1, 1902, at which date the system of wall inspection was initiated. It has come to my knowledge, while on my vacation recently, that in Toronto, Canada, a city which, from the standpoint of municipal administration, seems to me to be, in many ways, a model one, a strong demand is arising for greater care in public control of location of new walls.

There is an increase of 52 subdivisions prepared and duplicated for the assessor's office, or 12 per cent, adding 104 more separate plats to the total for the year, the recording of many being still delayed.

There is an increase of 166, or 22 per cent, in the number of plats of lots made to accompany applications for building permits. These are now made gratuitously for the public, the advantage to the building office in point of clearness of intention of builders being thought so considerable as to offset the value of the drafting work, though the latter is annoying in being something requiring immediate attention, so as to facilitate the paper work of building operations. The drafting force being very limited this special item constantly interferes with regular current work.

There is a heavy decrease (about 40 per cent) in the number of plats and parts of plats prepared preliminary to surveys, due to the very large amount of this kind of work done in recent years and now available, slight additions to existing plats being, in many cases, all that is found necessary. This is as it should be, as the work is always done with a view to future use. A steady offset to this gain lies in the constant wearing out from long use of the old working plats of squares made previous to 1895 when the office had not been reorganized, and there was so little opportunity to renew the plats of survey in a general and systematic way.

There is an increase of 151 in the total of estimates of cost, made out in triplicate, or 11 per cent, due largely to surveys of new walls.

There is an increase of 200, or about 4 per cent, in the total of plats of all kinds made for the public and for the District. The total this year is 5,431, which is significant of the strain on the drafting force, which has not been satisfactorily arranged during the past year. Almost the entire time of one man is taken up in preparing the plats of subdivisions, plats for building applications, and triplicate plats for alley condemnation, etc.

The entire time of another man is needed for the making out of certificate plats of surveys and the copying of the same into the books.

About two-thirds of the time of another is essential for the recording of plats of subdivisions and the making of large plats requiring great care and expert work.

As there is considerable miscellaneous plat work coming in with no regularity, but needed at once when needed at all, it is clear that not less than three draftsmen are essential for the work of this office. The preparation of plats for field use in surveys has always been done by the clerk who receives orders for work, and attends to all business with the public not necessarily brought to the personal attention of the surveyor, and this item of drafting work, often taking hours in single cases, is not included at all in the above summary. It requires long experience with the records and special expert knowledge, and although the amount of this work begins to show a decrease, the continual and heavy increase of the other duties of the clerk in charge leaves him no time whatever to assist the regular draftsmen with any of their work.

No plat is supposed to go into the hands of the field assistants for action until it has been checked as to all essentials by another clerk than the one who makes it. This duty devolves upon the record clerk, who, among many other matters, has charge also of all the correspondence with the building office, with which this office is working in perfect accord. He also prepares for indexing and filing every document which can not be at once entered by the typewriter from the current books, etc. The latter is constantly adding to the card index a reference to every fact which is now or may be of value to the office, and keeps up a scrapbook on the same plan, each item being indexed. The card indexes are now working so admirably, both for the office force and for the general public, that it is difficult to see how the present volume of business could be carried on without them.

There is an increase of 119, or 95 per cent, in the total of reports on various subjects (not indorsements, but such as initiate in this office).

The total of plats for private parties is given as 3,802, which should be increased to 4,824 by the 1,022 copies of survey certificates to place it on the same basis as in last year's report, the District being charged with them this year.

There is an increase of 5 per cent in the number of letters written.

An increase of 717 over last year in the number of separate entries on the order book, or 43 per cent, is significant of the steady growth of the work of the office.

The year closing June, 1902, showing the heaviest volume of business in the history of the office up to that time, the percentages of increase this year over last year, noted above in almost every item, show that the steady increase shown for many years is fully maintained and closely follows the great growth of the city in building matters, population, and real-estate values.

The facilities afforded by the office are now so generally availed of that hardly any case of transfer of title, new building, or readjustment of lines is undertaken without first having the matter begun in this office. Although the labor of the entire office force is continually increasing for this reason (the number of men not being kept at all times commensurate with the need), the policy of the office is always to encourage the fullest possible use of these facilities. It is a matter of satisfaction that the yearly appropriations for the office show a gradual but decided approximation to the needs. The chief trouble is the lack of elasticity in the means upon which the office depends, it having been hitherto out of the question to hold any money in reserve for the sudden demands of large surveys and subdivisions, made often at a time when the simple current work absorbs all the time of everyone in the office. Again, such special demand can not be met by taking on new men inexperienced in the methods of work found essential, so that the lack of money is by no means the sole difficulty.

A brief comparison of the volume of business this year with that of the year ending June 30, 1898, is of some interest.

The number of lots and parcels surveyed for the public and the District was about 600 in 1898 and 1,270 in 1903. The subdivisions were 120 in 1898 and 465 in 1903. The plats made were about 1,600 in 1898 and 5,431 in 1903.

These items indicate how necessary it is to consider the needs of the office at present wholly without reference to the money provided some years ago, which even then was inadequate, Mr. W. P. Richards reporting in 1898 that the work of that year was about double the volume in 1895, when the office was reorganized.

During the latter part of this fiscal year there was completed all of the field work and nearly all of the office work of the special resurvey of the Beatty and Hawkins addition to Georgetown, authorized by Congress, and a contract has been made for the photolithographing of the resulting map. The full utilization of this work, which it is hoped can be made, will have to be dealt with later on, the result now in hand being simply the very accurate topographical map which must be the first step in the matter. In this connection I wish to acknowledge the courtesy of Miss Westcott, the principal of the Western High School, who granted us for several months the use of a room in her building, which is close to the Beatty and Hawkins addition. There was no space whatever in this office, nor could any be obtained in this building for the making of the very large map in this case, which was carried along concurrently with the field work. This special survey has been most efficiently pushed to completion by Mr. Talcott, the assistant surveyor, in spite of constant interruption caused by the current city surveys, which frequently could not be kept up by the remaining force, that had enough to do in the suburbs alone.

During the year a very accurate outline survey was made of the National Zoological Park, and a map was made showing the relation of the park to the neighboring streets and roads.

I wish to make most hearty acknowledgment of the good work done by the office force, done quite often under adverse conditions, continuous and connected attention to one thing at a time being often impracticable by reason of the multiplicity of orders requiring at least partial execution to enable builders to retain the services of mechanics.

I consider it simply a plain business requirement essential to the full success of the office that a sufficient equipment of men, horses, and supplies of all sorts be provided to enable the office to execute at once any reasonable order, without hurry and confusion at any point, the work being of too responsible a nature to permit of anything but deliberation. It should not be necessary to sidetrack any item of work for a more convenient season.

Very respectfully,

HENRY B. LOOKER,  
*Surveyor District of Columbia.*

Maj. JOHN BIDDLE,  
*Corps of Engineers, U. S. Army,  
Engineer Commissioner District of Columbia.*

(Through Captain Newcomer.)

# 36 OPERATIONS OF THE ENGINEER DEPARTMENT, D. C.

Statement showing in detail the number of persons other than day laborers who were employed on regular and continuous work during the fiscal year ended June 30, 1903, under authority of and paid from general appropriations.

Title of appropriation and rating.	Per diem.	Per annum.
SALARIES.		
Surveyor's office: Appropriation for salaries of employees.....	\$13,000.00	
Contingent and miscellaneous expenses: Appropriation for survey of Beatty and Hawkins addition to Georgetown.....	2,000.00	
Improvements and repairs: Appropriation for plats of subdivisions outside of Washington.....	634.25	
Total of appropriation.....	15,634.25	
Employees of surveyor's office on per diem basis and paid out of above appropriations:		
1 clerk.....	\$5.00	\$1,565.00
1 record clerk.....	3.00	909.00
1 clerk.....	2.75	880.00
1 computer.....	4.00	1,222.00
1 draftsman.....	3.00	909.00
1 draftsman.....	3.25	1,017.25
1 assistant engineer.....	5.00	1,565.00
1 assistant engineer.....	4.50	1,408.50
1 rodman.....	3.00	909.00
2 rodmen.....	2.50	1,565.00
2 chainmen.....	2.25	1,408.50
1 laborer.....	1.50	459.50
3 drivers.....	1.75	1,642.25
1 charwoman.....	.33	104.00

## REPORT OF THE SUPERINTENDENT OF PARKING.

WASHINGTON, D. C., August 8, 1903.

SIR: I have the honor to submit the following report of the operations of this office during the fiscal year ended June 30, 1903:

As set forth in the accompanying tabulated statement, 2,310 trees were planted on the streets of the city and District, distributed among the several sections as follows: Northwest, 1,372; northeast, 667; southwest, 27; southeast, 244. By comparison with the number of trees set out the previous year (2,600), the above statement will show a decrease of 290, which, though small, may be accounted for by the excessively wet weather of the past spring, which rendered the soil unfit for handling during the entire months of March and April. The weather during these two months being also quite warm caused the trees to leaf so rapidly and to such an extent that their transplanting could not be continued with probability of success after the middle of May.

In nursery rows this spring 3,400 seedlings were set out, consisting of 500 Norway maples, 700 red oaks, 700 American elms, and 1,500 sycamores. These, added to the 22,000 reported for the previous year, minus the 2,310 planted on the streets this year, make a total of 23,090 now in nursery rows. When additional ground was designated for nursery purposes, large quantities of seed were sown with a view of having on hand a much larger stock of trees in case Congress should appropriate more liberally for this branch of the District work, and while it is difficult to state exactly the number of seedlings in the seed beds, it is believed that the following figures are approximately correct, of which a majority are of suitable size for setting in nursery rows were it desirable to do so to such an extent: Twenty thousand Norway maples, 200 English sycamore maples, 20,000 red oaks, 3,000 pin oaks, 1,000 English pyramidal oaks, 5,000 sycamores, 3,000 elms, and about 500 ash.

A large part of these it is proposed to place in nursery rows during the next spring. Both the nurseries are abundantly stocked with trees of a proper size for street planting, and a large number in the old nursery are becoming overgrown.

In addition to performing a vast amount of trimming at the request of numerous individuals, as well as work found actually necessary and which could not be reached in the regular order in time to afford needed relief, the systematic work was resumed at a point on Eighteenth street, where it had ceased the previous year. From this place it was continued eastwardly to Sixth street NW., in the vicinity of R street, and all that section embraced between Florida avenue on the north and the Mall on the south was covered. In the prosecution of this work hundreds of loads of brush were carted to the dumps, the most accessible now being located at Twentieth street NW., just south of Virginia avenue; K street NE., between Ninth and Tenth streets;

Kentucky avenue SE., near the Pennsylvania Avenue Bridge, and Third street SW., near the arsenal wall. It will be observed that the dumps are very distant from the central portions of the city, where trees were first planted, are consequently larger, and require more trimming.

Five hundred and thirty-four trees were removed from the streets, parkings, etc., of which 252 were dead, or so nearly so that their removal was advantageous. Of the number dead, 66 had undoubtedly been killed by gas, and it is supposed that about 75 had been killed by street improvements (resetting of curb, laying of cement sidewalks, etc.). Of the 252 dead, 159 stood in brick sidewalks, 65 in cement sidewalks, and the remaining 28 were removed from parkings, etc. From the fact that the great majority of trees removed had stood in brick sidewalks, the general belief that cement sidewalks are very injurious to street trees would not seem to have been substantiated. Widening of roadways, changing of grade, etc., are still causing a large number of removals, among which may be noted the following: Thirty-three from Columbia road, between Sixteenth and Eighteenth streets; 20 from Massachusetts avenue extended, just east of Rock Creek; 9 from Tennessee avenue, between East Capitol and B streets; 32 from Ninth street and Bunker Hill road, Brookland; 7 from Tenth street, between Lansing and Providence streets, Brookland; 14 from the west side of Fifteenth street NE., between F and G streets; 5 from east side of Second street SE., between M and N streets, and 9 from Nichols avenue, Anacostia, which interfered with electric wires.

Five reservations were graded, soiled, and seeded in grass, as follows: One bounded by Columbia road, Twentieth street, and Wyoming avenue; one bounded by Columbia road and Connecticut and California avenues; one bounded by Massachusetts avenue and Twenty-fourth and S streets; one at the Joliet street entrance to the Zoo, from Connecticut avenue; one in the center of Quincy street, subdivision of Fernwood.

The circle at the intersection of Third and T streets, Le Droit Park, which had been improved the previous year, but was not in good condition, was again prepared and sown in grass. The above named and all other improved reservations of the District, including the central parkings on Indiana avenue NW., C street NW. between First street and New Jersey avenue, and Pennsylvania avenue SE. between Second street and the bridge over the Eastern Branch, were regularly mowed and at this time are all in good condition, with the exception of the central parking on New York avenue NW. between Eleventh and Thirteenth streets, which, I regret to say, is in rather a bad state. This I attribute to the presence of so many elm-tree roots, which absorb a too large quantity, if not all, of the moisture and fertility of the soil. In my opinion, to obtain a good turf on this parking it would be necessary to remove a great many of these roots, which without doubt would result in serious injury to the trees, and as I consider the latter of more importance at this place than the grass I think it should not be done.

The wiring of trees includes the putting on of new wires, the readjusting of tight wires, removal of wooden boxes and replacement of same with wires. One thousand rods of woven-wire netting were purchased during the year, and taking the city systematically, beginning on North Capitol street and working westwardly between Florida avenue and the Mall, Twenty-third street was reached, 4,170 trees being provided with the new material. In the area embraced by this treatment all tight wires in condition to permit of it were loosened, old and badly broken wires removed and replaced by new, and all wooden boxes which could be spared were removed and the trees wired instead. Of the last-named boxes about 1,200 were conveyed to the old nursery and all lumber in suitable condition selected therefrom and used in the making of boxes for the next planting season—the coming fall.

To about 750 elms of a few years' growth, which had been attacked by a "purple louse," an insecticide, consisting of lime, water, and salt, was applied, with apparently good results. The older trees of this variety were not similarly attacked.

Caterpillars appeared during the month of June, but with the very frequent heavy showers, which destroyed their nests to considerable extent, and the use of the money allotted from the emergency fund for their removal they were kept under control, and no perceptible destruction of foliage resulted.

The very favorable weather of the past spring has caused the trees to make probably an unprecedented growth of leaves and young wood and at this time they present an appearance rarely if ever seen at this season of the year. I have watched with much concern the condition of trees planted in cement sidewalks, in spaces 3 or 3½ by 7 feet, where the roadways are of asphalt, and as yet have discovered no apparent difference between them and others planted in parking strips or in brick sidewalks. Under the conditions named, however, it does not seem possible for them to continue to prosper to the extent they have in the earlier stages of their existence; yet it can be plainly observed that there are trees of various kinds situated as above described doing as well as are those growing under much more

favorable conditions in this District; for example, the elms on New Hampshire avenue, between Pennsylvania avenue and U street, excepting those between M street and Dupont circle, some of which are rather inferior; those on New Jersey avenue, East Capitol street, and First streets NE., SE., and SW., which are not excelled by any of like variety here. The elms in the Market Park, where they should do as well as in their natural element, make a growth which does not exceed that of the ones previously mentioned and their foliage is no greener. Notwithstanding these facts, however, I would suggest that in future where asphalt roadways and cement sidewalks are laid with spaces reserved in the latter for trees these spaces be left as large as the available area and public comfort will permit.

The employment of a clerk has enabled the assistant superintendent to spend much more time on outdoor supervision than was possible under previous conditions, the result being that there are a smaller number of dead trees on the streets and less dead wood in others than was formerly the case. Besides this, several other improvements in the service are noted.

The following is a statement of the total amounts paid during the year to employees above the grade of skilled laborer, and also gives the sums from which such payments were made:

Employees.	Rate.	Amount received.	Parking commission.	Emergency fund.	Deposit Capital Traction Co.	Deposit Potomac Electric Power Co.	Deposit Chesapeake and Potomac Telephone Co.
Foreman .....	\$3.50	\$1,043.61	\$996.36	\$45.50	\$1.75		
Do.....	3.00	909.00	909.00				
Do.....	3.00	897.00	897.00				
Do.....	3.00	912.75	906.75			\$6.00	
Subforeman .....	2.50	787.75	755.25	\$1.25			\$1.25
Clerk.....	2.00	330.00	330.00				

Forage for three horses in use by this department was purchased from the appropriation for "Contingent expenses, engineer department, 1903," at a total cost of \$400. No horses, harness, or wagons were purchased during the year.

#### *Expenditure of funds.*

Appropriation for the fiscal year.....	\$25,000.00
Allotment from emergency fund for removal of caterpillars .....	600.00
Obtained from other District appropriations.....	355.63
Deposits of companies, individuals, etc.....	119.55
Total sum available.....	26,075.18
Deducted to pay for horseshoeing, repairing tools, etc.....	57.07
	26,018.11

#### LABOR.

Planting of trees on the streets, including their removal from the nurseries, and the boxing, staking, and strapping of the same .....	\$5,084.46
General care of the nurseries, including the planting of seedlings, cultivation of these and previously planted ones, and repairing and making over of old boxes removed from streets. ....	2,554.50
Trimming of the trees on the streets.....	4,024.50
Removal of trees from the streets.....	1,610.80
Grading, soiling, and seeding of reservations, the general care of the same and other improved reservations, and the mowing of weeds on unimproved parkings .....	2,176.35
Paving around tree spaces and over holes where trees were removed and not replaced .....	477.45
Repairing of storm damages.....	343.50
Putting on new wires, readjusting of tight wires, removal of wooden boxes and replacing with wires.....	1,415.15
Removing caterpillars and applying insecticide to young trees which had been affected by a "purple louse," etc.....	975.31
Cultivating of trees on the streets.....	3,614.56
Gathering of tree seeds .....	9.25
	22,285.51

## MATERIALS.

Lumber and cedar posts .....	1,396.82	
Woven-wire netting .....	1,000.00	
Telegraph wire, for making hooks .....	52.00	
Wire staples .....	28.00	
Galvanized strap iron for boxes .....	87.17	
Leather straps for strapping trees .....	54.00	
One tool wagon .....	47.00	
Soil .....	152.30	
Nails, various sizes .....	102.38	
Repairing fence on Highland Terrace .....	174.00	
Grass seed, manure, and fertilizer .....	89.18	
Four lawn mowers .....	34.40	
One typewriter (Underwood) .....	85.00	
Street-car tickets .....	30.00	
Introducing water service to reservation .....	37.00	
Miscellaneous items (hose, rope, horseshoes, etc.) .....	292.24	
		3,661.49
		25,947.32
Balance unexpended (park commission appropriation, \$62.74, and emergency fund, \$8.05) .....		70.79

*Trees on the streets.*

Trees.	Previously planted.	Planted during year.	Removed during year.	Now on streets.
Ash .....	735		11	724
Catalpa .....	600		9	591
Cypress .....	26			26
Elms .....	8,062	207	37	8,222
Horse chestnuts .....	250	2		252
Kentucky coffee .....	105			105
Lindens .....	7,000	65	26	7,039
Locusts .....	1,050		19	1,031
Soft maples .....	25,671	153	154	25,670
Norway maple .....	7,182	336	50	7,468
Red maples .....	925		8	917
Sycamore maples .....	375		4	371
Sugar maples .....	7,680	442	19	8,103
Negundoes .....	1,800		55	1,745
Pinoaks .....	580	619	3	1,196
Red oaks .....	417			417
Sw. wh. oaks .....	50			50
English oaks .....	82			82
Willow oaks .....	10			10
Car. poplars .....	6,719		38	6,681
Athenian poplars .....	750		18	732
Turkeystan poplars .....	42			42
Mixed poplars .....	1,200			1,200
Sycamores .....	11,240	401	41	11,600
Sweetgums .....	230			230
Ginckoes .....	540	85	5	620
Tulips .....	2,020		15	2,005
Miscellaneous .....	300		22	278
Total .....	85,681	2,310	534	87,407

NOTE.—The above number includes the 1,144 trees in Petworth, as reported to you December 3, 1902.

T. LANHAM,

*Superintendent of Parking, District of Columbia.*

Maj. JOHN BIDDLE,

*Corps of Engineers, U. S. Army,*

*Engineer Commissioner, District of Columbia.*

(Through Capt. H. C. Newcomer.)

**SUBSURFACE AND BUILDING DIVISIONS.**

Capt. CHESTER HARDING,

*Corps of Engineers, United States Army, Assistant to the Engineer Commissioner in charge.*

WATER DISTRIBUTION.....	W. A. MCFARLAND, <i>Superintendent Water Department</i>
WATER RATES.....	GEORGE F. GREEN, <i>Water Registrar and Chief Clerk Water Department</i>
SEWER CONSTRUCTION AND MAINTENANCE .....	D. E. MCCOMB, <i>Superintendent of Sewers.</i>
PLUMBING PLANS AND INSPECTION.....	H. B. DAVIS, <i>Inspector of Plumbing.</i>
BUILDING AND BUILDING INSPECTION.....	SNOWDEN ASHFORD, <i>Inspector of Buildings.</i>
	A. M. LAWSON, <i>Inspector of Elevators.</i>
REPAIRS TO BUILDINGS .....	G. B. COLEMAN, <i>Superintendent of Repairs.</i>

**REPORT OF ASSISTANT IN CHARGE.**OFFICE OF THE ENGINEER COMMISSIONER,  
DISTRICT OF COLUMBIA,  
*Washington, October 21, 1903.*

MAJOR: I have the honor to forward herewith the reports of the divisions of the engineer department under my charge for the year ending June 30, 1903, as submitted by the superintendent of the water department, the water registrar, the superintendent of sewers, the inspector of plumbing, the inspector of buildings, and the superintendent of repairs.

Very respectfully, your obedient servant,

CHESTER HARDING,

*Captain, Corps of Engineers, Assistant to Engineer Commissioner.*

Maj. JOHN BIDDLE,

*Corps of Engineers, Engineer Commissioner.***REPORT OF THE SUPERINTENDENT OF THE WATER DEPARTMENT.**WASHINGTON, D. C., *August 28, 1903.*

SIR: I have the honor to submit the following report of work done by the distribution branch of the water department during the fiscal year ending June 30, 1903.

The routine work of main extension, fire hydrant erection, etc., is fully set forth in the accompanying tables, to which reference is made for details of cost, etc.

The total length of mains laid during the year is 61,841 linear feet. Thirty five hydrants were set, making a total number available for use of 2,144.

**PUMPING STATIONS.**

*U street.*—No changes of importance were made in the equipment during the year. Following are items of chief interest from station records:

Water pumped during year:			
Middle service .....	million gallons..	2,967	
High service.....	do.....	106	
Total.....	do.....	2,973	
Water pumped per day during year:			
Middle service.....	gallons..	7,855,753	
High service.....	do.....	292,674	
Total.....	do.....	8,148,427	
Coal burned during year.....	pounds..	5,802,351	
Coal burned per day, mean.....	do.....	15,896	
Cost of coal per year.....		\$9,040.00	
Cost of coal per day, mean.....		\$24.76	

## Cost of pumping during the year:

Running expenses at station—	
Labor .....	\$12,233.50
Coal .....	9,040.11
Oil .....	594.23
Waste .....	354.31
Miscellaneous supplies .....	377.21
Material for repairs .....	402.72
Total .....	23,002.08
Per day, mean .....	\$63.02
Cost of land .....	2,275.00
Cost of building .....	30,000.00
Cost of machinery .....	75,000.00
	107,275.00
Interest, at 3 per cent. ....	3,218.25
Depreciation, building and machinery .....	3,150.00
Grand total .....	29,370.33
Per day .....	80.46
Total cost of pumping 1,000 gallons under actual conditions (including interest and depreciation) .....	99 cents.

*Anacostia station.*

Water pumped during year .....	million gallons..	151
Mean per day .....	do.....	413.698
Coal burned during year .....	pounds..	680,378
Coal burned per day, mean .....	do.....	1,864
Cost of coal per year .....		\$1,057.76
Cost of coal per day, mean .....		\$2.89

## Cost of pumping:

Labor .....	\$4,981.62
Oil .....	75.91
Coal .....	1,057.76
Waste .....	7.93
Miscellaneous items .....	1,324.62
Material for repairs .....	10.94
Total .....	7,458.78
Per day, mean .....	\$20.43
Cost of land .....	900.00
Cost of building .....	5,039.72
Value of machinery .....	1,000.00
	6,939.72
Interest, at 3 per cent .....	208.19
Depreciation, building and machinery .....	181.18
Grand total .....	7,848.15
Per day .....	21.50
Total cost pumping 1,000 gallons under actual conditions .....	5.19 cents.

*Reservoirs.*—Reno and Brightwood reservoirs have been in continuous service during the year; plans have been completed for a water tower and watchman's lodge adjacent to Reno reservoir, and it is believed that this work will be completed during the next fiscal year. At Brightwood reservoir negotiations are in progress to secure land on which to build a house for the permanent watchman.

*Trumbull street pumping station.*—Work on this building is well on toward completion, and a small amount of the mechanical equipment has been installed. During the year additional contracts were made for coal and ash conveyors and for elevators. No parts of the pumping engines have yet been received. On June 14 the engine-room electric 20-ton crane was put in service, current being received from a 50-kilowatt Westinghouse direct-connected generator, steam being supplied from a 35-horsepower locomotive boiler temporarily erected outside of the building. Coal pockets of armored concrete, with a capacity of 1,000 tons, have been completed.

## 42 OPERATIONS OF THE ENGINEER DEPARTMENT, D. C.

*Large trunk mains.*—Of the large trunk mains forming a part of the new distribution system, the following were practically completed during the year: Thirty-six-inch from Fourth and R streets NW. to Fourth and B streets NE., via R street, Florida avenue, and Fourth street east (first high service); 36-inch from Thirteenth street and Florida avenue to Trumbull street station, via Florida avenue, Grant street, Brightwood avenue, and Trumbull street (second high service).

Three 48-inch lines from Washington reservoir to Trumbull street station (gravity) and one 48-inch line from Second and U streets NW. south on Second street to Florida avenue (first high service).

*Miscellaneous.*—The work of indexing all water valves in the city has been continued without intermission, and it is hoped that the work may be practically completed during the next fiscal year.

Specifications have been drawn and bids asked for 300 high-pressure fire hydrants, award to be made after competitive tests.

A large amount of miscellaneous repair work has been done, chiefly to fire hydrants and street mains. Much trouble with the latter is caused by defective pipes laid many years ago.

In conclusion I wish to record my appreciation of the active interest shown by the employees of this department in the execution of their work, and of the excellent results obtained.

Very respectfully,

W. A. MCFARLAND,  
*Superintendent Water Department.*

Maj. JOHN BIDDLE,  
*Corps of Engineers, U. S. Army,*  
*Engineer Commissioner, District of Columbia.*  
(Through Captain Harding.)

TABLE I.—*Mains laid and miscellaneous work during the fiscal year ending June 30, 1903.*

New mains laid:	
48 inches diameter.....	linear feet.. 2,123
36 inches diameter.....	do..... 14,601
20 inches diameter.....	do..... 5
12 inches diameter.....	do..... 10,163
6 inches diameter.....	do..... 37,271
4 inches diameter.....	do..... 2,545
3 inches diameter.....	do..... 650
1½ inches diameter.....	do..... 1,045
Mains lowered.....	do..... 432
New stop valves.....	137
Fire hydrants erected.....	30
Public hydrants erected.....	7
Horse fountains erected.....	5

TABLE II.—*Summary of the distribution system.*

	In service prior to June 30, 1902.	Added dur- ing fiscal year.	Total June 30, 1903.
75 inches diameter.....	linear feet.. 600		600
48 inches diameter.....	do..... 30,000	2,123	32,123
36 inches diameter.....	do..... 34,082	14,601	48,683
30 inches diameter.....	do..... 38,947		38,947
24 inches diameter.....	do..... 21,545		21,545
20 inches diameter.....	do..... 36,569	35	36,604
16 inches diameter.....	do..... 2,508		2,508
12 inches diameter.....	do..... 214,987	10,163	a 225,150
10 inches diameter.....	do..... 10,255		10,255
Total trunk mains.....	389,493	26,922	416,415
8 inches diameter.....	linear feet.. 6,005		6,005
6 inches diameter.....	do..... 1,469,064	37,271	b 1,506,335
4 inches diameter.....	do..... 138,296	2,545	140,841
3 inches diameter.....	do..... 63,067	650	63,717
2½ inches diameter.....	do..... 242		242
2 inches diameter.....	do..... 4,118		4,118
1½ inches diameter.....	do..... 3,802		3,802
1¼ inches diameter.....	do.....	1,045	1,045
Grand total.....	2,069,087	68,433	2,137,520
Stop valves.....	4,366	137	4,503
Fire hydrants.....	2,114	30	2,144
Public hydrants.....	329	7	336
Service connections.....	47,999	1,453	49,452
Horse fountains.....	96	5	101

a 764 feet of 12-inch main abandoned.  
b 1,575 feet of 6-inch main abandoned.

c 8 public hydrants abandoned.

TABLE III.—Statement showing costs of water mains laid during the fiscal year ending June 30, 1903.

Location.	Size.	Length.	Cost of labor.	Cost of material.	Total cost.
Rock Creek Church road NW., between Harewood and Shepherd roads.....	Inches. 11	Lin. ft. 1,045	\$148.75	\$72.11	\$220.86
Alley, square 198.....	3	185.6	54.50	142.38	196.88
Alley, square 534.....	3	35.2	14.75	31.01	45.76
Alley, square 70.....	4	140	41.50	36.37	77.87
Alley, square 67.....	4	159.1	40.87	78.86	119.73
Alley, square 247.....	4	106.9	38.37	128.34	166.71
Alley, square 15.....	4	139.4	52.50	79.05	131.55
Rock Creek Church road NW., west from Brightwood avenue.....	4	562.2	143.88	252.12	396.00
Center Sheridan street NW., east from Sixteenth street.....	4	600	127.82	191.12	318.94
Alley, square 511.....	4	296.6	108.12	174.02	282.14
South side S street NW., between Nineteenth and Twentieth streets.....	6	392.5	105.00	244.70	349.70
Center Observatory place NW., from U street to Linthicum place, and center of Linthicum place west from Observatory place.....	6	806.1	229.19	407.68	636.87
Center South street NW., west from Thirty-first street.....	6	313.6	190.31	176.60	366.91
East side Kentucky avenue SE., between D and E streets.....	6	266.8	104.50	169.68	274.18
West side New Hampshire avenue NW., north from Lydecker avenue.....	3 6	115.3 471.6	143.38	266.93	410.31
East side Sherman avenue NW., north from Irving street.....	6	76.5	26.87	74.71	101.58
North side Quincey street NW., east from Connecticut avenue extended.....	6	802.2	149.12	408.34	557.46
West side Sherman avenue NW., south from Marshall street.....	6	144	51.38	107.70	159.08
Center Franklin street, Anacostia, west from Nichols avenue.....	6	613	143.75	261.22	404.97
South side Decatur street NW., west from Florida avenue.....	6	1,452.5	342.88	770.52	1,113.40
North side S street NW., between Nineteenth and Twentieth streets.....	6	445.3	128.50	274.33	402.83
West side Sherman avenue NW., between Wallach and Marshall streets.....	6	150	33.62	65.44	99.06
Center Fifteenth street SE., between Kentucky avenue and E street.....	6	160	35.50	80.46	115.96
East side Spring street, Anacostia, between Maple and Arthur streets.....	6	165.4	66.76	116.04	182.80
Center V street NW., between Flagler and First streets.....	6	308.6	94.13	138.34	232.47
East side Tenth street NE., between I and K streets.....	6	170.3	25.25	80.13	105.38
Center W street NW., west from Fourth street.....	6	224	60.32	129.74	190.06
Center Hubbard place NW., between Woodley road and Pierrepont place, and center Pierrepont place, between Hubbard place and Thirty-fourth street.....	6	732.3	165.00	369.46	534.46
North side S street NW., between Twenty-second and Twenty-fourth streets.....	6	537.2	167.88	251.39	419.27
South side Baltimore street NW., west from Nineteenth street.....	6	209	44.75	104.80	149.55
Center Tenth street NE., between D and E streets.....	6	379	111.75	164.74	276.49
East side Eighteenth street NW., between N street and Connecticut avenue.....	6	164.3	56.50	131.05	187.55
Center Brandywine street NW., west from Illinois avenue.....	6	450	104.69	251.22	355.91
Center K street NE., east from Fourteenth street.....	6	372.2	71.75	175.65	247.40
West side New Jersey avenue SE., between L and K streets.....	6	430.8	169.00	331.54	500.54
East side Eighth street SW., south from I street.....	6	141.2	34.50	105.29	139.79
Center Messmore street NW., between Columbia road and Huron street.....	6	221	88.19	115.76	203.95
East side Twelfth street SE., between East Capitol and B streets.....	6	226.7	69.81	140.84	210.65
North side South Carolina avenue SE., east from Fourteenth street.....	6	143.4	36.69	143.56	180.25
Center Jefferson street, Anacostia, east from Taylor street.....	6	21.6	9.00	9.54	18.54
South side Sixteenth street NW., south from Kenesaw avenue.....	6	400	155.50	171.12	326.62
North side Columbia road NW., between Eighteenth street and Champlain avenue.....	6	120.8	41.25	115.98	157.23
Center Princeton street NW., east from Sherman avenue.....	6	260	61.25	141.34	202.59
Center Grant street NW., east from Eighteenth street.....	6	365.9	116.94	159.30	276.24
West side North Capitol street NW., between I and K streets.....	6	436.6	148.62	270.28	418.90

TABLE III.—Statement showing costs of water mains laid during the fiscal year ending June 30, 1903—Continued.

Location.	Size.	Length.	Cost of labor.	Cost of material.	Total cost.
Center Washington street, Anacostia, east from Taylor street.....	Inches. 6	Lin. ft. 199.9	\$127.50	\$90.18	\$217.68
Center W street NE., west from First street.....	6	118.7	40.25	70.99	111.24
North side Baltimore street NW., between Nineteenth and Twentieth streets; east side Twentieth street, between Baltimore and Cincinnati streets.....	6	1,699.4	461.83	774.68	1,236.51
East side Sherman avenue NW., south from Irving street.....	6	729	204.61	400.22	604.83
West side Fourteenth street NE., between East Capitol and A streets.....	6	210.6	67.37	117.31	184.68
Center D street SE., between Fourteenth and Fifteenth streets.....	6	225.2	79.38	120.40	199.78
East side Eleventh street NW., south from Harvard street.....	6	249.2	92.63	189.21	281.84
North and south sides Rhode Island avenue NW., between North Capitol and First streets.....	6	1,163.8	186.24	593.00	779.24
North and south sides Cincinnati street NW., from Columbia road to Adams Mill road.....	6	674.3	194.25	396.71	590.96
East and west sides Eleventh street NW., between Kenyon and Dartmouth streets.....	6	815.4	183.00	530.83	713.83
Center Dartmouth street NW., between Eleventh and Thirteenth streets.....	6	440.8	101.25	188.21	289.46
South side Bunker Hill road NE., between Lincoln avenue and Seventh street.....	6	997.6	365.50	680.69	1,046.19
Center Emporia street NE., between Twelfth and Thirteenth streets.....	6	146.3	57.50	67.53	125.03
Center Erie street NW., between Central and Ontario avenues.....	6	360.7	82.25	164.81	247.06
Center Lowell street NW., west from Eighteenth street.....	6	343.5	132.25	168.54	300.79
East side Second street SW., between I and K streets.....	6	326.8	115.74	181.32	297.06
East side Sixth street NW., between Pennsylvania and Missouri avenues, and north side Missouri avenue, east from Sixth street.....	6	241.3	90.12	173.54	263.66
Breeds terrace NW., east from Center street.....	6	118	22.75	51.15	73.90
West side P street NW., between Eighteenth street and Dupont circle.....	6	267.5	112.00	344.81	456.81
North side Columbia road NW., south from Champlain avenue.....	6	692.5	173.00	340.72	513.72
Center Sheridan street NW., between Sixteenth and Brown streets.....	6	400	94.25	168.72	262.97
Center E street NW., west from Twenty-second street.....	6	251.2	72.00	110.08	182.08
East and west sides Eleventh street NW., between Wallach and Marshall streets.....	6	889.9	203.37	556.97	760.34
South side U street NW., between First and Second streets.....	6	225.7	81.87	149.22	231.09
Center Vine street, Takoma Park, between Maple avenue and B. & O. R. R. tracks.....	6	356.7	108.87	200.36	309.23
East side Brightwood avenue NW., between Hancock and Marshall streets.....	6	140.5	63.00	105.77	168.77
Center Nineteenth street NW., north from Howard avenue.....	6	106.6	35.75	117.02	152.77
North side R street NE., between Third and Fourth streets.....	6	228.9	95.50	109.55	205.05
Center Princeton street NW., between Thirteenth and Eleventh streets.....	6	101.7	37.50	47.26	84.76
Center Thirteenth street NW., between Roanoke and Yale streets.....	6	371.9	98.50	160.18	258.68
North side M street NE., between Eleventh and Twelfth streets.....	6	388.7	95.13	182.88	278.01
North and south sides Massachusetts avenue SE., east from Thirteenth street.....	6	439.6	80.87	289.06	369.93
Center Thirteenth street SE., between C and D streets.....	6	178.8	48.50	80.70	129.20
North and south sides of Rhode Island avenue NE., east from Fifth street.....	6	395.1	70.25	271.35	341.60
West side First street NE., between M and Patterson streets.....	6	294.7	90.56	224.47	315.03
South side Oakwood terrace NW., east from Howard avenue.....	6	414.5	139.62	207.03	346.65
Center Seventh street NE., between Hartford and Indianapolis streets.....	6	396.9	98.94	227.31	326.25
Center Thirtieth street NW., south from O street.....	6	152	53.75	134.14	187.89
East side North Capitol street NE., north from Quincy street.....	6	118.6	79.31	199.82	279.13
North side Adams Mill road NW., west from Lanier place.....	6	189.6	38.75	92.98	131.73
East and west sides North Capitol street, between S and Senon streets.....	6	388.6	98.75	177.51	276.26

TABLE III.—Statement showing costs of water mains laid during the fiscal year ending June 30, 1903—Continued.

Location.	Size.	Length.	Cost of labor.	Cost of material.	Total cost.
East side Twenty-fourth street NW., between S and Bancroft streets.....	Inches. 6	Lin. ft. 204.3	\$68.24	\$93.99	\$152.23
Center Blair road, Takoma Park, south from Washash street.....	6	267	65.63	132.21	197.84
Center Twelfth street NE., between Dover and Frankfort streets.....	6	354.6	95.75	151.47	247.22
East side Fourteenth street NE., between Emporia and Frankfort streets, and on Frankfort street east from Fourteenth street.....	6	557.6	77.75	298.46	376.21
North side N street NW., between Twenty-second and Twenty-third streets.....	6	303.2	83.00	133.81	216.81
Connections and blow-offs in various sections.....	6	122	158.60	327.22	485.82
	3	115	14.50	26.24	40.74
Center Tenth street NE., between B and East Capitol streets; east side Sixth street NE., between B and East Capitol streets; east side Second street NE., between B and East Capitol streets.....	12	2,554.5	1,127.44	4,243.58	5,371.02
West side Twenty-fourth street NW., between Pennsylvania avenue and M street.....	12	888.4	473.75	1,515.25	1,989.00
West side Bladensburg road NE., from butterline factory to Twenty-eighth street.....	6	61.0			
West side Bladensburg road NE., from Standard Butterline property to Twenty-eighth street; center Twenty-eighth street, from Bladensburg road to Baltimore and Ohio R. R. crossing at Vista street; on Vista street from Baltimore and Ohio R. R. to South Dakota avenue; on south side South Dakota avenue to Rhode Island avenue.....	12	1,080.3	372.06	1,162.07	1,524.13
Bladensburg road NE., between H street and Mount Olivet road <sup>a</sup> .....	6	118.3			
South from U street NW., in Le Droit avenue, to Florida avenue; on Florida avenue to Fourth street NW. <sup>a</sup> .....	12	4,287.7	1,936.25	6,363.76	8,300.01
North from B street NE., in Fourth street, to Florida avenue, and in Florida avenue from Fourth street east to R street west <sup>a</sup> .....	48	2,123.3	9,093.32		9,093.32
	6	1,251			
	20	35	31,728.42	11,660.93	43,389.35
	36	14,601.4			
Total cost for laying mains and connections, including repairs to pavements.....			54,771.38	43,727.52	98,498.90
Water mains commenced but not completed, June 30, 1903.....			27.75	305.43	333.18
Cost of erecting fire hydrants, including repairs to pavements.....			322.57	1,787.25	2,109.82
Cost of superintendence.....			1,538.86		1,538.86
Grand total.....			56,660.56	45,820.20	102,480.76

<sup>a</sup> Not completed June 30, 1903.

TABLE IV.—Statement of length and cost of water mains laid from July 1, 1878, to June 30, 1903.

Fiscal year.	48-inch.	36-inch.	30-inch.	24-inch.	20-inch.	16-inch.	12-inch.	10-inch.	8-inch.
	Lin. ft.	Lin. ft.	Lin. ft.	Lin. ft.	Lin. ft.	Lin. ft.	Lin. ft.	Lin. ft.	Lin. ft.
1878.....		40					3,719		
1879.....							7,409		
1880.....									
1881.....									
1882.....									
1883.....							1,625		26
1884.....							1,038		
1885.....							763		
1886.....							1,938	791	
1887.....					4,835		1,124	2,998	
1888.....							731		
1889.....			2,312	5,140			5,626	2,784	
1890.....									
1891.....							5,201		
1892.....					2,926	2,500	10,163		
1893.....							6,473		
1894.....					278		39,386		
1895.....			6,617				27,731		
1896.....			294		8,874		11,873		
1897.....					2,180		6,877		
1898.....							7,698		907
1899.....					1,914		2,220		
1900.....		10,902		35	1,282	48	157		
1901.....							10,026		
1902.....			1,227		203		14,010		
1903.....	2,123	14,601			35		9,411		
Total.....	2,123	25,543	1,227	9,258	27,667	2,548	175,199	6,573	933

# 46 OPERATIONS OF THE ENGINEER DEPARTMENT, D. C.

TABLE IV.—Statement of length and cost of water mains laid from July 1, 1878, to June 30, 1903—Continued.

Fiscal year.	6-inch.	4-inch.	3-inch.	2½-inch.	2-inch.	1½-inch.	1-inch.	Total.	Cost.
	Lin. ft.	Lin. ft.	Lin. ft.	Lin. ft.	Lin. ft.	Lin. ft.	Lin. ft.	Lin. ft.	
1878.....	12,781	30						16,570	\$14,846.28
1879.....	8,516	1,397						17,322	19,426.66
1880.....	3,024							3,024	
1881.....	3,709							3,709	3,112.70
1882.....	1,920							1,920	1,628.66
1883.....	4,084							5,785	8,073.79
1884.....	8,972							10,010	10,492.51
1885.....	27,766	358	485					29,372	25,865.55
1886.....	35,192		6,623					44,544	40,025.19
1887.....	30,041	292	7,124					46,414	56,961.00
1888.....	9,123	9,148	3,937					22,939	17,626.65
1889.....	36,742	6,571	8,753					67,928	79,342.16
1890.....	34,737	2,856	2,855					40,448	19,113.54
1891.....	56,893	3,142	11,013					76,249	49,702.65
1892.....	88,709	3,342	1,286					108,926	74,733.00
1893.....	54,173	8,336	3,458					72,440	56,338.99
1894.....	86,632	12,832	2,918					142,046	126,596.55
1895.....	103,785	5,442	2,733					146,308	134,502.22
1896.....	61,464	1,738	3,262					87,505	89,385.12
1897.....	71,266	10,595	992			2,104		94,014	77,954.42
1898.....	52,371	6,735	2,790		1,633	500		72,634	48,661.79
1899.....	84,291	4,662	2,701		79	133		96,000	65,774.32
1900.....	53,838	4,211	2,116		17	453		73,059	114,784.22
1901.....	52,018	2,187	935			646		65,812	47,426.71
1902.....	35,481	1,414	1,632	242				54,209	57,078.28
1903.....	32,264	2,004	357				1,045	61,840	98,698.90
Total.....	1,049,792	87,292	65,970	242	1,729	3,836	1,045	1,460,977	1,338,559.11

TABLE V.—Average cost per foot for laying mains of various sizes, excluding repairs to improved pavements, during the fiscal year ending June 30, 1903.

Size.	Linear feet.	Cost of labor.	Cost of material.	Total cost.
1½-inch.....	1,045	\$0.142	\$0.069	\$0.211
2-inch.....	221	.313	.295	.608
4-inch.....	2,004	.275	.410	.685
6-inch.....	30,712	.275	.537	.812
12-inch.....	8,990	.434	1.290	1.724

TABLE VI.—Statement of length and cost of water mains laid for the extension of the high service system of water distribution from July 1, 1893, to June 30, 1903.

Size of main.	Laid to June 30, 1902.	Laid during year ending June 30, 1903.	Total.
1½-inch.....		1,045	1.06
2-inch.....	2,717		2.71
3-inch.....	1,095		1.06
4-inch.....	1,808	115	1.93
6-inch.....	5,701	1,321	7.02
12-inch.....	188,477	25,960	214.43
16-inch.....	98,035	8,523	106.56
20-inch.....	48		.48
24-inch.....	14,732	35	14.76
30-inch.....	6,946		6.96
36-inch.....	1,227		1.27
48-inch.....	10,902	14,601	25.50
		2,123	2.13
Total.....	331,688	53,713	385.41

Total cost to June 30, 1902.....\$434,392.19  
Total cost for fiscal year ending June 30, 1903.....89,474.54

Aggregate cost to June 30, 1903.....523,866.73

# OPERATIONS OF THE ENGINEER DEPARTMENT, D. C.

47

TABLE VII.—Daily average water consumption, middle and high services.

Month.	Middle.	High.	Month.	Middle.	High.
1902.			1903.		
July.....	8,560,258	309,073	January.....	8,416,952	299,922
August.....	7,905,647	303,136	February.....	7,790,271	293,985
September.....	7,850,731	299,875	March.....	7,243,602	275,520
October.....	8,194,162	285,077	April.....	7,156,314	278,500
November.....	7,792,561	236,140	May.....	7,839,880	393,640
December.....	8,135,820	264,782	June.....	7,635,854	285,075

TABLE VIII.—Statement of the number of shallow and deep wells.

	Shallow wells.	Deep wells.	Total.
In service June 30, 1902.....	62	40	102
Closed and discontinued during fiscal year ending June 30, 1903.....	0	0	0
In service June 30, 1903.....	62	40	102

Statement showing in detail the number of persons other than day laborers who were employed on regular and continuous work for thirty days or more during the fiscal year ended June 30, 1903, under authority of and paid from general appropriations.

Title of appropriation, and rating.	Per diem.	Total.
<i>Paid from appropriations, water department.</i>		
1 assistant engineer.....	\$6.00	\$1,876.00
1 superintendent of construction.....	6.00	1,876.00
1 clerk.....	5.00	1,512.00
Do.....	4.50	468.00
Do.....	4.00	1,200.00
6 inspectors.....	4.50	5,427.00
2 inspectors.....	4.00	1,198.00
1 assistant engineer.....	4.50	1,294.50
1 chief steam engineer.....	4.50	1,402.85
1 leveler.....	4.00	1,225.50
1 draftsman.....	3.50	1,016.50
1 assistant draftsman.....	2.75	786.12
1 rodman.....	3.00	780.00
Do.....	2.60	665.70
1 chainman.....	2.25	194.75
1 assistant machinist.....	3.50	1,088.26
Do.....	3.00	188.75
2 plumbers.....	3.50	2,075.50
1 plumber.....	3.00	782.00
1 assistant foreman.....	3.75	641.69
2 assistant foremen.....	3.50	2,251.26
1 assistant foreman.....	8.00	896.50
1 carpenter.....	3.50	1,007.57
1 blacksmith.....	3.50	1,008.43
1 storekeeper.....	3.00	966.25
1 assistant storekeeper.....	2.50	807.50
3 assistant foremen.....	2.50	617.00
2 assistant steam engineers.....	8.00	576.75
3 assistant steam engineers.....	2.50	2,387.50
3 firemen.....	2.50	2,608.13
Do.....	2.00	2,142.00
1 watchman.....	2.50	908.75
4 watchmen.....	1.75	2,545.75
4 oilers.....	1.75	2,349.17
2 messengers.....	1.75	1,063.99
2 drivers.....	1.75	948.94
Total.....		48,608.81

## REPORT OF THE WATER REGISTRAR.

WASHINGTON, August 17, 1903.

SIR: Complying with the order of June 20, 1903, I present herewith the annual estimates and report of the revenue and inspection branch of the water department for the fiscal year ending June 30, 1903. The report shows the financial condition and the work performed.

	Number or amount.	Increase or decrease (-) compared with 1902.
Inspections made, noted, and recorded.....	160,835	Per cent. 31
Cash receipts posted; average item, \$6.....	\$408,000	1
Premises in which leaks were found.....	10,523	6
Water-rent bills delivered by inspectors.....	31,944	-2
Water-rent bills made out.....	65,000	
Water-main assessment notices delivered.....	1,002	1
Tax certificates examined.....	6,799	1
Taps issued.....	1,457	1
Stopcocks issued.....	1,396	10
Permits examined.....	2,673	3
Files received, recorded, and acted on.....	900	
Letters sent out.....	482	-1
Permits for water for building purposes.....	682	7

The financial condition, as will be seen by the comparative statement of revenues, Table II, shows the collections as surpassing those of the past.

During the year 255 new water meters were installed, making the total number in use 1,748.

In February last a committee consisting of Messrs. Moncure Burke, of the engineer department, and H. L. Karpeles, of this office, was designated to examine into the method of accounting in the water office and devise a system that would prove more effective and expansive than that in vogue, and at the same time reduce the liability for error. As a result a card-record system has been installed in which each account is numerically designated, the said number being carried to a water-rent bill with duplicate coupons. After payment of the bill to the collector of taxes one coupon is transmitted to this office on the date of and a short time subsequent to the payment and is immediately entered of record. On the following day the collector's day books are forwarded and the payments posted the day previous checked.

Although the work shows a steady increase, yet at the close of business June 30, 1903, the same was up to date.

One clerk, at \$1,400 per annum, has been detailed to the assessor's office in charge of water-main tax accounts.

In conclusion, I desire to express my appreciation to the employees of this office for the efficient discharge of their duties.

Four tables are herewith submitted.

Very respectfully,

GEO. F. GREEN,

Water Registrar, District of Columbia.

Maj. JOHN BIDDLE,

Corps of Engineers, U. S. Army,

Engineer Commissioner, District of Columbia.

(Through Captain Harding.)

TABLE I.—Comparative statement of revenues.

Fiscal year.	Water rents.	Water-main assessments.	Taps and stopcocks.	Permits, etc.	Total revenues.
1893.....	\$235,911.25	\$70,026.33	\$7,307.09	\$7,931.71	\$321,176.38
1894.....	245,899.69	86,975.41	4,497.00	1,168.79	338,542.89
1895.....	251,872.71	72,972.24	4,537.55	2,100.60	331,483.10
1896.....	255,439.11	27,666.57	4,026.00	1,191.09	288,323.77
1897.....	253,500.16	53,653.39	5,157.00	1,128.28	313,439.83
1898.....	264,784.48	58,152.56	6,910.65	1,104.42	330,952.11
1899.....	276,065.54	62,937.43	6,327.00	1,545.15	346,875.12
1900.....	286,257.63	53,420.70	5,208.15	4,452.53	349,339.01
1901.....	303,557.19	56,359.72	6,140.85	3,064.39	369,122.15
1902.....	318,404.39	65,962.47	6,368.16	4,659.00	395,394.02
1903.....	326,789.26	70,880.32	6,787.77	3,628.18	408,085.53
1904 <sup>a</sup> .....	331,000.00	60,000.00	7,000.00	4,000.00	402,000.00
1905 <sup>a</sup> .....	336,000.00	60,000.00	7,000.00	4,000.00	407,000.00

<sup>a</sup> Estimated.

TABLE II.—Statement of assessments and collections of water-main taxes from July 1, 1878, to June 30, 1903.

Fiscal year.	From July 1, 1878, to June 30, 1902.	1903.	Total.
Amount of water-main tax assessed.....	<sup>a</sup> \$1,340,232.20	\$35,055.97	\$1,375,288.17
Duplicate and over payments.....	2,104.45	.....	2,104.45
Six per cent abatement.....	29,822.85	.....	29,822.85
Amount of water-main tax canceled.....	223,137.98	787.85	223,925.83
Amount of water-main tax collected.....	1,001,932.41	70,880.32	1,072,812.73
Amount of collectible water-main tax outstanding....	87,443.41	<sup>b</sup> 36,612.20	50,831.21

<sup>a</sup> Of this amount, \$94,124.78 was outstanding and uncollected July 1, 1878.

<sup>b</sup> This amount is the excess of the amounts collected, canceled, and abated over the tax levied.

RECAPITULATION.

Amount of assessments and duplicate payments.....	\$1,377,392.62
Amount of abatement, at 6 per cent.....	29,822.85
Amount of water-main tax canceled.....	223,925.83
Amount of water-main tax collected.....	1,072,812.73
Amount of water-main tax outstanding July 1, 1903.....	50,831.21
Total.....	1,377,392.62

TABLE III.—Premises in the District of Columbia supplied with Potomac water.

Number of dwellings to June 30, 1902.....	47,801
Introductions to June 30, 1903.....	1,448
Total.....	49,249

MISCELLANEOUS UNMETERED WATER TAKERS.

Asylums.....	5	Hospitals.....	9
Bakeries.....	51	Halls.....	41
Bathhouses.....	6	Ice companies.....	3
Banks.....	4	Laundries.....	213
Barrooms.....	324	Offices.....	415
Barber shops.....	238	Oyster depots.....	11
Freight depot.....	1	Photograph galleries.....	21
Railway waiting station.....	1	Schools.....	89
Churches.....	73	Pool rooms.....	41
Carpet-cleaning establishments.....	4	Printing offices.....	20
Dyehouses.....	13	Stables.....	840
Dining and lunch rooms.....	149	Stores.....	2,688
Dairies.....	44	Shops.....	309
Engines, gas and steam.....	92	Stone yards.....	10
Factories.....	23	Shooting galleries.....	6
Flats.....	229	Undertakers.....	17
Foundries.....	2	Wood and coal yards.....	25
Greenhouses.....	9	Warehouses.....	46

TABLE IV.—Water meters.

Name.	½-in.	¾-in.	1-in.	1½-in.	2-in.	3-in.	4-in.	6-in.	Registers.	Total.
Worthington.....	.....	.....	3	13	14	23	16	4	.....	73
Thomson.....	4	3	115	94	60	87	5	3	1	322
Crown.....	1	5	15	30	32	20	11	1	5	120
Union.....	.....	1	45	52	13	12	1	1	.....	125
Niagara.....	.....	.....	8	1	2	.....	.....	.....	.....	6
Lambert.....	.....	.....	60	17	19	8	3	1	1	109
Gem.....	.....	1	.....	.....	.....	11	9	1	2	24
Hersey Disk.....	.....	1	2	1	4	4	.....	.....	.....	12
Trident.....	.....	.....	3	3	2	.....	1	.....	.....	9
Pittsburg.....	.....	1	22	28	17	10	16	.....	.....	94
Registers.....	.....	.....	.....	.....	.....	.....	.....	.....	5	5
Nash.....	8	10	322	268	150	66	14	9	2	849
Total.....	13	21	588	509	312	193	76	20	11	1,748

## 50 OPERATIONS OF THE ENGINEER DEPARTMENT, D. C.

*Statement showing in detail the number of persons, other than day laborers, who were employed on regular and continuous work during the fiscal year ended June 30, 1903, under authority of and paid from general appropriations.*

Title of appropriation and rating.	Per diem.	Total.
Extension of the high service, water department:		
1 inspector .....	\$3.00	\$987.33
13 inspectors .....	2.50	7,117.50
1 assistant tapper .....	2.50	416.30
Do .....	2.75	390.12
Total .....		8,911.65

### REPORT OF THE SUPERINTENDENT OF SEWERS.

WASHINGTON, October 3, 1903.

SIR: I have the honor to submit the following report of the operations of the sewer division for the fiscal year ending June 30, 1903.

Under the appropriation for cleaning and repairing sewers and basins, the following described work was performed:

#### *Sewers and appurtenances cleaned and repaired.*

Cleaned:		
Pipe sewers .....		127,918
Main sewers .....		21,046
Manholes .....		321
Catch basins .....		102,788
Gravel basins .....		19
Basin outlets .....		25
Street detritus and sludge removed .....	cubic yards	9,121
Sumps .....		29
Repaired:		
Invert repaired .....	feet	473
Pipe sewers taken up and relaid .....	do	936
Basins constructed .....		4
Basins reconstructed .....		22
Basins repaired .....		128
Basin tops replaced (artificial and bluestone) .....		92
Covers (cast iron) replaced .....		239
Basins abandoned .....		4
Manholes constructed .....		8
Manholes reconstructed .....		2
Manholes adjusted .....		10
Manholes repaired .....		38
Manholes abandoned .....		4
Alley grates and frames placed .....		25
Manhole frames replaced .....		147
Siphon .....		1
Bulkheads constructed .....		6
Total number of jobs of all kinds performed .....		1,431

A section (473 linear feet) of invert was repaired under contract with Warren F. Brenizer Company in the North Capitol street sewer between I street and K street. The outlets of Anacostia main sewers were cleaned. The flushing gate at the outlet of the Tiber sewer was operated throughout the year.

Amount expended for cleaning catch basins ..... \$13,217.81  
Amount expended for manual flushing of sewers ..... 3,996.52

The tidal sewers and sediment chambers were cleaned as required. Two flushing gangs were employed through the year, flushing pipe sewers, and also two gangs cleaning catch basins.

#### MAIN AND PIPE SEWERS.

Sewers were constructed, under contracts, in Thirteenth street SW., between B street and Potomac River; in S street NW., between Eighteenth and Nineteenth

streets; in Fourteenth street SW., between Maryland avenue and D street; in D street SW., between Fourteenth and Fifteenth streets; and in Fifteenth street SW., between D and C streets.

There were constructed, by day labor, 6,380 linear feet pipe sewers, varying in size from 8 to 24 inches in diameter (42 manholes), divided among 41 jobs, the average length per job being 153.17 linear feet, the average cost per job being \$399.69.

There were also constructed 81 catch basins, 2,528 linear feet connections, varying in size from 8 to 18 inches in diameter (10 manholes), divided among 60 jobs, the average length of connection per job being 42.1 linear feet, the average cost per basin job being \$131.54.

#### SUBURBAN SEWERS.

Sewers were constructed, under contracts, in Fifth street NW., between Morris and Sumner streets; in Morris street NW., between Fifth street and alley; and in alley between Morris and Hancock streets; through the grounds of Westminster College; in Hartford street NE., between Ninth and Thirteenth streets; in Cathedral avenue NW., between Connecticut avenue and Woodley road.

There were constructed, by day labor, 10,232 linear feet pipe sewers, varying in size from 8 to 24 inches in diameter (49 manholes), divided among 44 jobs, the average length per job being 232.55 linear feet, the average cost per job being \$486.09+.

#### ASSESSMENT AND PERMIT WORK.

*Permit work.*—There were constructed, by day labor, 4,614 linear feet pipe sewers, varying in size from 8 to 24 inches in diameter (21 manholes), divided among 41 jobs; the average length per job being 112.54 linear feet, the average cost per job being \$193.063, the average cost per foot being \$1.715.

*Assessment.*—Sewers were constructed, under contracts, in Galena street NE., between Sixth and Seventh streets, and in Jefferson street SE. from a point 620 feet east of Taylor street.

There were constructed, by day labor, 20,313 linear feet pipe sewers, varying in size from 8 to 12 inches in diameter (86 manholes), divided among 71 jobs, the average length per job being 286.1 linear feet, the average cost per job being \$457.89, the average cost per foot being \$1.60+. Five catch basins were constructed, 3 catch basins were reconstructed, 36 linear feet pipe connections were constructed, divided among 8 jobs, the average length of connection per job being 4.5 linear feet, the average cost per basin job being \$53.981.

#### AUTOMATIC FLUSHING TANKS.

Seven flushing basins were constructed in various locations.

#### MAIN THROUGH THE LANDS OF W. D. DAVIDGE AND TRINITY COLLEGE.

The sewer through the lands of W. D. Davidge and Trinity College was completed, under contract, by M. F. Talty.

#### SEWAGE PUMPING STATION.

The work on Second street SE., between N street and Anacostia River, under contract No. 2893, with Andrew Gleeson, was completed.

The work under contract No. 3186, with Ambrose B. Stannard, is in progress.

The work under contract No. 3061, with W. F. Brenizer, is in progress.

#### UNUSED BALANCES.

The sewer connections in square No. 631 and at First street and Indiana avenue NW. with the Tiber Creek sewer were made by Andrew Gleeson under contract No. 2893.

#### LOW-AREA TRUNK SEWER.

A section of the low-area trunk sewer was completed by E. G. Gummel under contract No. 3037.

Work was in progress on the section awarded to the Warren F. Brenizer Company under contract No. 3182.

#### BOUNDARY SEWER.

Work was in progress on the extension of the Boundary sewer by Arthur Cowsill under contract No. 3068.

## EAST SIDE INTERCEPTING SEWER.

Work was in progress on the east side intercepting sewer between Twenty-second and A streets and Twelfth and M streets by Andrew Gleeson under contract No. 3062.

## B STREET AND NEW JERSEY AVENUE TRUNK SEWER.

Work was in progress on section A of B street and New Jersey avenue trunk sewer on New Jersey avenue SE. between N and I streets by B. J. Sullivan under contract No. 3165.

## GEORGETOWN TRUNK SEWER.

The sewer through the grounds of Georgetown College was practically completed by Coyle & Co. under contract No. 3168.

## TABLES.

- Table 1 shows work performed under contracts.  
 Table 2 shows work performed under permit system.  
 Table 3 shows work performed under assessment system.  
 Table 4 shows work performed under whole-cost system.  
 Table 5 shows work performed by day labor charged to the appropriation for main and pipe sewers.  
 Table 6 shows work performed by day labor charged to the appropriation for suburban sewers.  
 Table 7 shows work performed by day labor charged to various appropriations.  
 Table 8 shows the average cost per foot of sewers and the average cost of basins constructed by day labor.  
 Table 9 shows the number of foremen, inspectors, and other employees temporarily employed and the appropriations from which paid.  
 Table 10 shows the number of electric conduits laid during the fiscal year and the total number of conduits constructed.

## RECAPITULATION.

	Miles.
Length of sewers constructed in the fiscal year 1903:	
Main sewers, 14,877.25 linear feet.....	2.818
Pipe sewers, 71,802.7 linear feet.....	13.599
Total sewers constructed.....	16.417
Total length of sewers June 30, 1903:	
Main sewers.....	96.312
Pipe sewers.....	351.726
Total.....	448.038
Cost of sewer system to June 30, 1902.....	\$11,262,966.24
Cost of sewers (exclusive of maintenance), 1903.....	612,564.54
Total cost.....	11,875,530.78

## SEWAGE-DISPOSAL PROJECT.

Reasonable progress was made upon the various portions of the sewage-disposal project, viz: The extension of boundary sewer, the east-side intercepting sewer, the low-area trunk sewer, section A of the B street and New Jersey avenue trunk sewer, and the sewage pumping station. The estimated amount required to complete the project, in addition to amounts heretofore appropriated, is \$1,729,000. The expenditures to date on account of completed work aggregate \$1,233,092.44.

The appropriations to date on account of work in progress aggregate \$1,985,000.

A report upon the subject of the construction of service sewers, with draft of a proposed bill, was presented by a special committee to the Commissioners, and it is believed that the legislation recommended will equalize and make fair and reasonable the assessment charges against properties benefited.

I respectfully suggest that it would be a material help to the work of the office if the construction appropriations were so made that they would be available until

expended instead of lapsing with the fiscal year. There is no apparent advantage in the present arrangement and many disadvantages. I also suggest that an effort be made to raise the limit of expenditure permissible by day labor from \$1,000 to \$3,000. This is especially desirable for emergency and repair work.

The requirement of the organic act that a bond not less than the amount of the contract shall be required from all contractors, running five years from the date of completion of the work, and that 10 per cent of the cost of all new work be retained as an additional guaranty, increases the cost of the work performed and is out of proportion to benefit derived by the District, except possibly for asphalt and other permanent work. I suggest that for sewer work the amount of the bond should not be more than 50 per cent of the cost of the work, and there is no advantage in making the time limit more than one year from the date of completion of the work. It is recommended that legislation be secured which will accomplish the change suggested.

Very respectfully, your obedient servant,

D. E. McComb,  
*Superintendent of Sewers.*

Maj. JOHN BIDDLE,  
*Corps of Engineers, U. S. Army,*  
*Engineer Commissioner, District of Columbia.*  
(Through Captain Harding.)

## 54 OPERATIONS OF THE ENGINEER DEPARTMENT, D. C.

TABLE 1.—Statement of sewers constructed under contracts

No. of contract.	Contractor.	Location.	Size of sewer.	Length of sewer.
				<i>Feet.</i>
2898	Andrew Gleeson....	Second street SE., between N street and Anacostia River.	Tide gate chambers .....	103.66
			12 feet by 10 feet 6 inches twin sewers.	471.29
			24-foot transition section.	50
			14 feet by 14 feet 3 inches sewer.	55
			3 feet by 5 feet oval suction conduit. <sup>a</sup>	474.52
			4-foot D sewer .....	103.15
			6 feet 3 inches transition section.	8
			6 feet 3 inches D sewer.	68
			Junction section .....	16
			5-foot transition section.	8
2893	.....do .....	Section B, Tiber Creek (square 631).	4 feet by 5 feet 6 inches section.	8
			14 feet by 14 feet 3 inches. Junction section .....	48
2893	.....do .....	Section C, Tiber Creek, First street and Indiana avenue.	9 by 11 feet .....	32.5
3065	The Warren F. Brenizer Co.	North Capitol street between I and K streets.	8-foot span .....	37
2965	John Jacoby .....	Through lands of W. D. Davidge and Trinity College.	15 feet 9 inches sewer .....	473
			5 feet 9 inches invert .....	362
			6-foot sewer .....	229
			6-foot invert .....	785
			6-foot diameter arch .....	40
3063	M. F. Talty .....	.....do .....	5 feet 9 inches diameter sewer.	716
			5 feet 6 inches diameter.	823.2
3087	E. G. Gummel .....	New Jersey avenue and N street SE. to New Jersey avenue and First street.	5 feet 9 inches arch .....	229
			3 feet 6 inches .....	2,968.88
			22 by 23 feet 6 inches .....	967
3068	Arthur Cowsill .....	Boundary sewer .....	6 feet diameter .....	3,600
3061	W. F. Brenizer .....	Near foot of New Jersey avenue SE.	3 feet 4 1/2 inches diameter	129.3
3062	Andrew Gleeson .....	East side intercepting sewer .....	Transition .....	8.2
			2.75 by 4.125 .....	791.7
3170	M. F. Talty .....	Thirteenth street SW., between B street and Potomac River.	24 inches .....	424.1
			21 inches .....	512.2
			2 by 3 feet .....	453.5
3171	The Warren F. Brenizer Co.	S street, between Eighteenth and Nineteenth streets NW.	24 inches .....	550.9
			.....do .....	416.5
3189	M. F. Talty .....	Fourth street SW., between Maryland avenue and D street.	18 inches .....	424.1
			.....do .....	416.5
			15 feet 6 inches .....	424.1
3168	Coyle & Co .....	Fifth NW., between Morris and Sumner; Morris, between Fifth and alley, and in alley between Morris and Hancock.	21 inches .....	331.4
			24 inches .....	413.7
3170	M. F. Talty .....	Through grounds of Westminster College.	3 feet 6 inches .....	383
3171	The Warren F. Brenizer Co.	Hartford street NE., between Ninth and Thirteenth streets.	24 inches .....	374
			21 inches .....	521.4
3189	M. F. Talty .....	Cathedral avenue, between Connecticut avenue and Woodley road.	24 inches .....	1,119.4
			18 inches .....	3
3182	The Warren F. Brenizer Co.	New Jersey avenue and First street to Pennsylvania avenue and John Marshall place.	3 feet 6 inches .....	529
3186	Ambrose B. Stannard.	Sewerage pumping station .....	Junction section .....	40
3165	B. J. Sullivan .....	New Jersey avenue SE., between I and N streets.	10 feet 6 inches by 9 feet.	16
			16 by 18 feet .....	909.85
			15 by 17 feet .....	190.65
3168	Coyle & Co .....	Through grounds of Georgetown College.	6 feet .....	2,601.8

<sup>a</sup> Includes screen and pump wells.<sup>b</sup> Includes \$35 deducted on account of quality of bronze hinges.<sup>c</sup> Includes work previously reported upon.<sup>d</sup> Includes \$2,246.27 for material, \$105.27 for repairs to gas mains in Lincoln avenue, \$140.64 for watchman and oil used in watching line during suspension of work, \$1,149.70 paid M. F. Talty for repairs, and \$687.75 paid M. F. Talty for work under contract No. 3063, being in excess of prices in John Jacoby's contract No. 2965.

chargeable to appropriations fiscal years 1902 and 1903.

Allowance to contractor.	Materials.		Cost of inspection.	Cost of repairs to pavements.	Total cost.	Appropriation.
	Chargeable.	Not charged.				
\$68,943.66	\$18,501.37	\$853.09	\$64.00	\$318.43	\$88,680.55	Sewerage pumping plant, 1901.
6,968.02	1,338.78	5.63	266.00	.....	8,578.43	Sewerage disposal system, unexpended balances. Do.
1,486.07	295.11	.....	80.50	.....	1,861.68	
4,882.57	1,232.44	34.20	264.00	.....	6,413.21	Cleaning and repairing sewers and basins, 1902.
5,298.06	4,329.63	145.77	.....	.....	9,768.46	Main through lands of W. D. Davidge and Trinity College, 1902.
10,401.75	2,665.71	156.49	284.00	.....	13,507.95	Do.
42,008.83	4,279.35	177.07	1,118.75	.....	47,584.00	Low area trunk sewer, 1902.
38,908.72	6,520.40	.....	1,217.00	.....	46,646.12	Extension boundary sewer, 1902. Sewerage pumping station, 1902. East side to Twelfth street, 1902.
18,803.50	1,716.75	.....	1,100.00	.....	21,620.25	
52,118.49	9,385.80	.....	3,051.50	.....	64,555.79	
8,554.69	1,800.41	695.53	533.50	374.43	11,958.56	Main and pipe sewers, 1903.
1,383.99	600.42	6.16	168.00	167.63	2,326.20	Do.
2,858.61	385.00	961.76	184.00	112.20	4,501.57	Do.
2,471.99	386.80	1,353.50	116.00	.....	4,328.29	Suburban sewers, 1903.
1,144.73	585.10	3.78	293.50	.....	2,027.11	Do.
2,238.84	324.45	738.43	180.00	25.20	3,506.92	Do.
3,313.01	333.90	905.69	204.00	.....	4,756.60	Do.
13,489.50	1,893.00	.....	607.00	.....	15,989.50	Low-area trunk sewer, 1903
13,830.00	.....	.....	32.00	.....	13,862.00	Sewerage pumping station, 1903.
63,056.40	14,558.60	.....	1,139.00	.....	78,754.00	B street and New Jersey avenue trunk sewer (section A), 1903-4.
18,797.15	7,487.80	.....	820.00	.....	27,104.95	Georgetown trunk sewer.

\* Includes \$4 for moving gas lamp at northwest corner Second and M SE.; \$4 for moving gas lamp at northeast corner Second and L streets SE., and \$4 for moving two naphtha lamps on Second between L and M SE.

f Work incomplete; payment made on account.

g Includes \$24, cost of cleaning sewer.

## 56 OPERATIONS OF THE ENGINEER DEPARTMENT, D. C.

TABLE 2.—Statement of sewers laid under the appropriation for assessment

VOLUNTARY

No. of order.	Location.	Pipe sewers laid (length in feet).						Manholes.	Branches.
		8-inch.	10-inch.	12-inch.	15-inch.	18-inch.	24-inch.		
34	Bladensburg road, crossing Mount Olivet road.....				50			1	
40	Brightwood avenue, at Harvard street.....		31						
21	Brightwood avenue, from Hancock street northward.		20					1	
4	Connecticut avenue, between M and N streets.....		75					1	3
14	D street SE., between Second and Third streets.....			75					
19	E street NW., between Twenty-second and Twenty-third streets.		71					1	4
36	E street NE., between Fifteenth street and Tennessee avenue.			243				1	4
3	First street NW., between Seaton and S streets.....			120					6
11	do.....			51					3
16	Florida avenue NW., between U and V streets.....	23						1	1
17	Square 15.....		133					1	2
23	Square 519.....		230	99				4	22
24	Fourteenth street NW., between Pennsylvania avenue and F street.				6	165		1	3
31	Square 455.....		16						2
33a	Fifth street SE., between D and E streets.....			8					1
10	Hopkins street NW., between O and P, Twentieth and Twenty-first streets.	26							1
22	Howard avenue and Piney Branch road, from intersection northward.			400				3	2
20	Ingleside, block 1.....			274				1	2
12	North Capitol street, between I and K streets NW.		108					1	1
29	Square 180.....			138				1	
33	Square 197.....		11						1
25	Rhode Island avenue NE., between Fifth and Sixth streets.			109					5
26	do.....			127					
8	Sherman avenue NW., from Irving street northward.		75						3
2	Square 79.....		41						4
13	Sheridan circle, between Twenty-third street and Massachusetts avenue.			32					1
15	Sheridan street, between Sixteenth and Seventeenth streets.		85						4
32	South Capitol street, between L and M streets SE.		266					1	7
39	Sheridan street, between Fourteenth and Sixteenth streets.		17						1
5	Square 1245.....	23							1
6	Block 36, addition to Ledroit Park.....			477					2
7	Square 236.....		32						1
27	Square 347.....	29							1
28	Thirteenth street SE., between B street and Massachusetts avenue.			390				2	6
30	Twelfth street SE., between D and E streets.....		22						2
37	Tennessee avenue NE., between E and Duncan streets.		82						5
38	Twenty-fourth street, between E and F streets NW.	115						2	5
18	V street NW., between Tenth and Eleventh streets.		15						
35	V street NE., between Fifth and Sixth streets.....					129			
1	Block 7, Washington Heights.....			54					
9	Whitney avenue, between Sherman avenue and Eleventh street.			121				1	8
	Total.....	216	1,330	2,718	56	165	129	21	117

a Amount carried forward to fiscal year 1904.

b Work completed in fiscal year 1904.

c \$138.58 of this amount charged to appropriation for main and pipe sewers, 1903.

d Awaiting bill for repairs to pavements.

# OPERATIONS OF THE ENGINEER DEPARTMENT, D. C. 57

and permit work and whole cost to applicant for fiscal year 1903.

## SYSTEM.

Amount of deposit.	Cost to District of Columbia.	Cost to applicant.	Total cost.	Amount returned.	For whom done.	Overseer.	Date of completion.
\$50.00	\$49.05	\$49.05	\$98.10	\$0.95	J. M. Burns .....	Lanigan ..	June 18, 1903
27.00	17.81	17.81	35.62	a 9.19	John A. Massie .....	Ward ..	(b)
15.00	14.63	14.63	29.26	.37	Chas. F. Buscher .....	do ..	June 22, 1903
70.00	c 162.09	23.51	185.60	46.49	Speiden & Speiden .....	do ..	Aug. 11, 1902
60.00	58.59	58.59	107.18		Directors Providence Hospital .....	Lanigan ..	(d)
75.00	61.73	61.73	123.46	13.27	Chas. N. Moore .....	do ..	Mar. 23, 1903
196.00	170.40	170.40	340.80		Geo. S. Cooper .....	Prince ..	(d)
96.00	77.36	77.36	154.72	18.64	F. A. Blundon and W. C. Freeman .....	Lanigan ..	July 23, 1902
40.00	27.09	27.09	54.18	12.91	F. A. Blundon .....	Thomas ..	Nov. 4, 1902
13.00	11.97	11.97	23.94	1.03	Chas. W. King .....	Lanigan ..	Dec. 2, 1902
108.50	103.89	103.89	208.78	5.11	Claude N. Bennett .....	Ward ..	Apr. 6, 1903
287.00	268.88	268.88	527.77	23.11	Harry Wardman .....	Thomas ..	Mar. 16, 1903
500.00	432.00	432.01	864.01	67.99	The Virginia Hotel Co. ....	Prince ..	Jan. 12, 1903
16.00	11.76	11.77	23.53	4.23	H. L. Turner .....	Ward ..	May 12, 1903
7.56	6.65	6.66	13.31	.84	John McLaughlin .....	do ..	July 6, 1903
25.00	21.29	21.30	42.59	8.70	John O. Johnson .....	do ..	Apr. 20, 1903
381.00	322.79	322.78	645.57	58.22	L. S. Lipscomb .....	Prince ..	Apr. 11, 1903
240.00	240.00	240.00	480.00		David Moore .....	Ward ..	Feb. 7, 1903
80.00	73.63	73.63	147.26	6.37	Gleeson & Humphrey .....	Prince ..	Nov. 14, 1902
170.00	156.19	156.19	310.38	14.81	Appleton Clark, Jr. ....	do ..	May 27, 1903
15.00	9.45	9.46	18.91	5.64	Rev. Father Paul Griffith ..	Lanigan ..	June 11, 1903
90.00	75.89	75.88	151.77	14.12	C. M. Campbell .....	Prince ..	Mar. 26, 1903
112.00	89.98	89.99	179.97	22.01	Northeast Eckington Improvement Association ..	do ..	Mar. 26, 1903
70.00	46.10	46.11	92.21	23.89	L. M. Saunders .....	Ward ..	Aug. 23, 1902
30.00	27.00	27.00	54.00	3.00	Mary L. Alexander .....	Lanigan ..	Aug. 7, 1902
24.00	15.16	15.17	30.33	8.83	Waddy B. Wood .....	Ward ..	Feb. 14, 1903
63.00	52.98	52.98	105.96	10.02	Chas. Schneider .....	Lanigan ..	Nov. 29, 1902
225.00	214.36	214.36	428.72	10.64	Rev. Father Manley .....	Ward ..	f July 6, 1903
18.00	13.06	13.07	26.13	4.93	Chas. W. King, jr. ....	do ..	June 26, 1903
18.00	16.66	16.66	33.32	1.34	Cloyd Tavenner .....	do ..	Oct. 25, 1902
400.00	361.80	361.79	723.59	38.21	M. F. Talty .....	Thomas ..	Aug. 27, 1902
22.00	21.01	21.01	42.02	.99	J. L. Matthews .....	Ward ..	Sept. 17, 1902
20.00	17.65	17.65	35.30	2.35	Wm. Henry Dennis .....	Prince ..	Apr. 2, 1903
355.00	342.73	342.74	686.47	12.26	W. E. Wright .....	Thomas ..	May 8, 1903
18.00	13.66	13.66	27.32	4.34	Wm. R. Shelton .....	do ..	Apr. 25, 1903
120.00	40.18	40.17	80.35	a 79.83	Geo. S. Cooper .....	Prince ..	(b)
110.00	105.25	105.25	210.50	4.75	F. S. Collins .....	Ward ..	June 29, 1903
12.00	9.58	9.58	19.16	2.42	W. H. Goines (chairman board of trustees) ..	do ..	c Aug. 6, 1903
170.00	152.01	152.01	304.02	17.99	Geo. C. Johnson .....	Prince ..	June 22, 1903
e 89.60	26.81	26.82	53.63	12.78	Maj. Frank Wheaton .....	do ..	July 1, 1902
122.00	99.43	99.42	198.85	22.58	S. E. Redfern .....	do ..	Sept. 15, 1902
4,509.60	4,027.05	3,888.54	7,915.59	590.05			

• Repairs to pavements made in fiscal year 1904.  
 f Repairs to pavements were completed in fiscal year 1904.  
 e \$89.60 balance brought forward from fiscal year 1902.

TABLE 3.—Statement of sewers laid under the appropriation for assessment

ASSESSMENT

No. of order.	Location.	Pipe sewers laid (length in feet).			
		8-inch.	10-inch.	12-inch.	18-inch.
146	A street SE., between Sixteenth and Seventeenth streets.	.....	.....	325	.....
122	Baltimore street NW., between Nineteenth and Twentieth streets.	.....	.....	312	.....
139	Brandywine street NW., between Ninth street and Brightwood avenue.	.....	424	.....	.....
102	Carroll avenue, between Blair road and B. & O. R. R.	.....	198	.....	.....
103	Carroll avenue, between B. & O. R. R. and east line lot 5, block 8.	241	.....	.....	.....
123	C street NE., between Thirteenth and Murray streets.	.....	.....	270	.....
134	C street NE., between Ninth and Tenth streets.	.....	.....	250	.....
106	Columbia road, between Quarry road and Ontario avenue.	.....	.....	532	.....
107	Columbia road, between Adams Mill road and Ontario avenue.	.....	.....	624	.....
108	Columbia road, between Eleventh and Thirteenth streets.	.....	.....	418.5	.....
111	Columbia road, between Sixteenth and Quarry road.	.....	.....	601.5	.....
112	Columbia road, between Ontario and Central avenues.	.....	159	.....	.....
117	Columbia road, between Champlain and Ontario avenues.	.....	135.3	.....	.....
137	Columbia road, between Sixteenth and Messmore streets.	.....	.....	389.5	.....
170	Connecticut avenue, between California and Wyoming avenues.	.....	.....	224.6	.....
179	Columbia street, between Eleventh and Thirteenth streets.	.....	180	.....	.....
116	D street SE., between Fourteenth and Fifteenth streets.	.....	117	.....	.....
133	Decatur street, between Florida avenue and Twenty-second street.	.....	.....	349	.....
138	Decatur street, between Massachusetts avenue and Twenty-second street.	.....	.....	324	.....
140	Decatur street, between Twenty-second and Massachusetts avenue.	.....	164.75	.....	.....
141	.....do.....	.....	.....	329	.....
142	.....do.....	.....	140	.....	.....
153	Duncan street, between Dover and Frankfort streets.	.....	.....	275	.....
155	Decatur street, between Twenty-second and Massachusetts avenue.	.....	248	.....	.....
166	Dartmouth street, between Eleventh and Thirteenth streets.	.....	.....	345.5	.....
105	E street NE., between Fourth and Fifth streets.	.....	.....	212	.....
121	Eleventh street, between Kenyon and Dartmouth.	.....	.....	278	.....
130	Eleventh street, between Princeton and Harvard.	.....	.....	243.2	.....
156	Eleventh street, between C and D streets NE.	.....	106	191	.....
162	Erie street, between Ontario and Central avenues.	.....	.....	275	.....
164	Eighteenth street and Columbia road (SW. corner).	.....	.....	3	.....
169	Eslin avenue and Lamar place (SE. corner).	.....	.....	6	.....
172	Eleventh street, between Wallach and Kenyon.	.....	.....	147	.....
100	Franklin street, from Nichols avenue southward.	.....	.....	423	.....
101	F street NW., between Sixth and Seventh streets.	.....	.....	50	.....
129	First street, between Baltimore and Albany streets.	.....	.....	306	.....
136	First street, between Pierce and M streets NW.	.....	61	.....	.....
163	Folsom street, between Newark and Omaha.	301.5	.....	.....	.....
176	Florida avenue, between North Capitol and P streets NE.	.....	.....	314.6	.....
152	G street SW., between Delaware avenue and One-half street.	.....	.....	135	.....
	Galena street, between Sixth and Seventh streets NE.	.....	.....	.....	628.7
159	Hancock street, between Brightwood and Warder avenues.	.....	.....	291	.....
165	Howard avenue, between Eighteenth and Nineteenth streets NW.	.....	.....	262.5	.....
119	Hubbard street, between Woodley road and Pierrepont street.	.....	482.7	.....	.....
	Jefferson street SE., from a point 620 feet east of Taylor.	.....	848.18	.....	.....
109	Kalorama Heights, block 7.	.....	86	.....	.....
154	K street SE., between Fourteenth and Fifteenth streets.	.....	.....	368.5	.....
171	M street NW., between Sixteenth and Seventeenth streets.	.....	.....	214.5	.....
149	Messmore, between Huron street and Columbia road.	.....	.....	277	.....
110	North Capitol and U streets (NE. corner).	.....	.....	.....	.....
126	Nichols avenue between Sheridan avenue and Franklin street.	.....	.....	313	.....

\* Constructed under contract No. 3171 by the Warren F. Brenizer Company.

# OPERATIONS OF THE ENGINEER DEPARTMENT, D. C. 59

mit work and whole cost to applicant for fiscal year 1903.

f.

1.	Basins.	Man-holes.	Branches.	Cost to District of Columbia.	Cost to property owner.	Total cost.	Overseer.	Date of completion.
		1	5	\$308.94	\$303.94	\$607.88	Thomas	Jan. 7, 1903
		1	8	350.04	350.04	700.08	do	Oct. 30, 1902
		2	18	288.96	288.96	577.92	Prince	Dec. 2, 1902
		1	6	205.05	205.05	410.10	Thomas	July 17, 1902
		1	5	188.96	188.96	377.91	do	July 22, 1902
		1	3	267.18	267.19	534.37	do	Nov. 24, 1902
		1	8	162.43	162.44	324.87	Prince	Apr. 18, 1903
		1	1	404.14	404.15	808.29	Ward	Sept. 2, 1902
		3		487.62	487.62	975.24	Prince	Sept. 4, 1902
		1	8	371.39	371.39	742.78	Thomas	Sept. 5, 1902
		3	1	504.68	504.68	1,009.36	Ward	Sept. 17, 1902
		1	2	185.20	185.20	370.40	Thomas and Prince	Sept. 13, 1902
		1	2	169.67	169.66	339.33	Thomas	Sept. 17, 1902
		2		356.25	356.26	712.51	do	Nov. 21, 1902
		1	1	200.05	200.05	400.10	Ward	June 25, 1903
		1	11	168.69	168.69	337.38	Thomas	June 24, 1903
		1	7	91.75	91.76	183.51	do	Oct. 18, 1902
		1		226.63	226.62	453.25	Ward	Nov. 15, 1902
		1		255.53	255.54	511.07	do	Nov. 28, 1902
		1	3	116.76	116.76	233.52	do	Dec. 6, 1902
		1		254.15	254.15	508.30	do	Dec. 9, 1902
		1	3	112.13	112.13	224.26	do	Dec. 10, 1902
		1	5	260.80	260.80	521.60	Prince	Jan. 26, 1903
		2	5	207.70	207.70	415.40	Ward	Jan. 27, 1903
		1	1	226.73	226.72	453.45	Prince	Apr. 1, 1903
		1		163.26	163.25	326.51	do	Sept. 3, 1902
		2	7	208.17	208.17	416.34	Ward	Oct. 7, 1902
		2	8	321.24	321.24	642.48	do	Nov. 6, 1902
		2	15	220.98	220.98	441.96	Prince	Feb. 15, 1903
		2		353.30	353.31	706.61	Thomas	Mar. 26, 1903
1						66.24	Lanigan	Mar. 25, 1903
1						46.06	do	Apr. 24, 1903
		1	8	114.12	114.13	228.25	Ward	May 8, 1903
		1	7	366.46	366.46	732.92	do	July 22, 1902
		1	2	58.21	58.22	116.43	Thomas	July 28, 1902
		1	17	303.24	303.24	606.48	do	Nov. 4, 1902
		1	2	34.53	34.54	69.07	Lanigan	Feb. 14, 1903
		1	24	183.32	183.33	366.65	Thomas	Apr. 1, 1903
		2	5	285.96	285.96	571.92	Ward	June 24, 1903
		1	5	105.91	105.90	211.81	Lanigan	May 2, 1903
		2	3	841.26	841.26	1,682.52	McLeod and Venable	Feb. 26, 1903
		1		220.21	220.22	440.43	Ward	Mar. 5, 1903
			3	186.25	186.25	372.50	Lanigan	Apr. 1, 1903
		2	13	308.59	308.59	617.18	Prince	Sept. 22, 1902
		2	82	952.99	952.99	1,905.98	Beach	Apr. 21, 1903
		1	7	87.84	87.84	175.68	Ward	Oct. 8, 1902
		1	1	314.77	314.77	629.54	Thomas	Jan. 28, 1903
		1	7	244.40	244.39	488.79	do	May 25, 1903
		2	1	270.35	270.36	540.71	Ward	Jan. 20, 1903
1						52.40	Lanigan	Sept. 12, 1902
		2	11	246.83	246.84	493.67	Prince	Nov. 23, 1902

<sup>b</sup> Constructed under contract No. 3191 by Andrew Gleason.

TABLE 3.—Statement of sewers laid under the appropriation for assessment

## ASSESSMENT

No. of order.	Location.	Pipe sewers laid (length in feet).			
		8-inch.	10-inch.	12-inch.	18-inch.
132	New Hampshire avenue, between Lydecker avenue and Spring road.	.....	255.1	.....	.....
144	Nineteenth, between California avenue and Columbia road.	.....	.....	207.3	.....
147	N street SW., between One-half and South Capitol streets.	.....	.....	221.5	.....
118	Pierrepont street, between Hubbard and Thirty-fourth NW.	.....	280	.....	.....
120	Pierce street, between Harrison and Jackson.	.....	.....	105.9	.....
158	Rhode Island avenue, between First and North Capitol streets NW.	.....	.....	528	.....
160	.....do.....	.....	270.5	.....	.....
161	.....do.....	.....	269	275	.....
113	Sheridan street, between Brown and Fourteenth streets.	.....	185	.....	.....
127	Seaton street NE., between North Capitol street and Lincoln avenue.	.....	.....	110.4	.....
128	South Carolina avenue SE., between Fourteenth and Fifteenth streets.	.....	.....	283	.....
145	S street NW., between Twenty-second and Twenty-fourth streets.	.....	.....	544	.....
175	Second and N streets SE. (northeast corner).	.....	.....	6	.....
178	Sheridan street NW., between Fourteenth and Sixteenth streets.	.....	230	6	.....
124	Spring street, between Maple avenue and Valley SE.	.....	165.5	.....	.....
131	Sixteenth street from Roedale southward.	.....	.....	99.87	.....
157	Sixteenth street from Kenesaw avenue southward.	.....	.....	211.5	.....
167	Sixteenth street, between Roedale and Kramer.	.....	.....	.....	.....
168	Sixth street, between K and L NE.	.....	.....	320.1	.....
104	Third and G streets NW. (northwest corner).	.....	.....	3	.....
114	Tenth street NE., between K and L streets.	.....	.....	339.5	.....
115	.....do.....	.....	.....	339.5	.....
125	Square 367.	.....	9	.....	.....
135	Tenth street, between C and D streets NE.	.....	.....	304	.....
143	Thirteenth street SE., between Massachusetts avenue and East Capitol.	.....	.....	176	.....
148	T street NE., between North Capitol street and Lincoln avenue.	.....	170	.....	.....
150	Tenth street NE., between D and E streets.	.....	.....	235	.....
151	Square 1009.	.....	65	.....	.....
174	Thirteenth and I streets NE. (northeast corner).	.....	.....	3	.....
177	Thirteenth street NW., between Roanoke and Princeton.	.....	.....	379	.....
	Total.....	542.5	5,229.03	14,577.47	648.7

OPERATIONS OF THE ENGINEER DEPARTMENT, D. C. 61

and permit work and whole cost to applicant for fiscal year 1903—Continued.

SYSTEM—Continued.

Basins recon-structed.	Basins.	Man-holes.	Branches.	Cost to District of Columbia.	Cost to property owner.	Total cost.	Overseer.	Date of completion.
		1	6	\$164.67	\$164.68	\$329.35	Ward .....	Nov. 8, 1902
		2	1	234.21	234.21	468.42	.....do .....	Mar. 25, 1903
		1	4	190.11	190.12	380.23	Lanigan .....	May 5, 1903
		1	10	142.54	142.55	285.09	Prince .....	Sept. 25, 1902
		1	4	84.61	84.60	169.21	.....do .....	Sept. 30, 1902
		2	8	418.04	418.08	836.07	.....do .....	Mar. 5, 1903
		1	14	171.94	171.95	343.89	.....do .....	Mar. 9, 1903
		2	20	402.16	402.16	804.32	.....do .....	Mar. 20, 1903
		1	7	109.22	109.22	218.44	Ward .....	Sept. 20, 1902
		1	4	127.99	127.98	255.97	Thomas .....	Oct. 8, 1902
		1	10	226.31	226.31	452.62	Prince .....	Oct. 31, 1902
		1	1	589.54	589.55	1,179.09	Ward .....	Jan. 3, 1903
1						63.32	Condon .....	June 10, 1903
		2	28	232.57	232.57	465.14	Ward .....	June 27, 1903
			8	116.87	116.87	233.74	Prince .....	Oct. 3, 1902
			5	54.55	54.55	109.10	.....do .....	Nov. 1, 1902
		1		212.65	212.65	425.30	Thomas .....	Mar. 3, 1903
1						46.36	Lanigan .....	Apr. 20, 1903
		1	5	255.34	255.35	510.69	Thomas .....	Apr. 29, 1903
		1				54.64	Lanigan .....	July 31, 1902
		2		244.06	244.07	488.13	Prince .....	Nov. 7, 1902
		2	1	235.65	235.65	471.30	.....do .....	Nov. 12, 1902
		1				47.64	Lanigan .....	Oct. 3, 1902
		1	7	199.86	199.86	399.72	Prince .....	Apr. 20, 1903
		1	1	166.11	166.11	332.22	Thomas .....	Apr. 17, 1903
		1	6	148.66	148.66	297.31	Prince .....	Jan. 15, 1903
		1	4	155.13	155.13	310.26	.....do .....	Apr. 23, 1903
		1	5	64.26	64.27	128.53	Thomas .....	Jan. 19, 1903
		1				55.19	Lanigan .....	June 20, 1903
		1	6	344.08	344.07	688.15	Ward .....	June 28, 1903
3	5	90	496	18,049.74	18,049.86	36,531.45		

TABLE 4.—

No. of order.	Location.	Pipe sewers laid (length in feet).		Man-holes ad-justed.	Basins aban-doned.	Basins.	Man-holes.
		10-inch.	12-inch.				
316	Champlain avenue, south of Superior street.				1		
309	Columbia road and old Sixteenth street NW. to Park street.			7			
317	Delaware avenue NE., between Massa-chusetts avenue and I street. <sup>b</sup>						
303	D street SE., between Second and Third streets.						1
301	Eleventh street NW., between F and G streets.						1
312	Square 564						1
318	First street NE., between I and K streets.		9			1	
306	G street NW., between Thirteenth and Fourteenth streets.						1
308	G street NW., between Twelfth and Thirteenth streets.						1
310	K street NW., between Sixth and Seventh streets.						1
304	L street NW., between Eighteenth street and Connecticut avenue.						1
314	R street NW., between Fourteenth and Fifteenth streets.	56					
300	Seventeenth NW., between G street and Pennsylvania avenue.		6			1	
302	Seventh street and Pennsylvania avenue NW. <sup>c</sup>						
311	Sixth street and Pennsylvania avenue (northwest corner). <sup>f</sup>						
305	Square 67						1
307	Twentieth street NW., between R and S streets.		3				1
315	V street NW., between Tenth and Eleventh streets.	113					1
Total.....		169	18	7	1	2	10

<sup>a</sup> Charged against general deposit.<sup>b</sup> Twenty test holes bored.<sup>c</sup> Overrun (\$1.31) of the estimated cost charged to the appropriation for assessment and permit work, 1903.<sup>d</sup> Overrun (\$1.15) of the estimated cost charged to the appropriation for construction and repair sewers and basins, 1903, on account of incidental repairs to sewer.<sup>e</sup> Awaiting bill for repairs to pavements.<sup>f</sup> Overrun (\$10.29) of the estimated cost charged to the appropriation for construction and repair sewers and basins, 1903, on account of incidental repairs to sewer.

*Whole cost.*

Branches.	Amount of deposit.	Total cost.	Amount returned.	For whom done.	Overseer.	Date of completion.
	\$25.00	\$21.64	\$3.16	Benj. F. Nicholas .....	Condon...	June 10, 1903.
		293.40	(a)	Washington Railway and Electric Co.	Lanigan...	Nov. 17, 1902.
	500.00	475.16	24.84	B. and O. R. R. Co. ....	Condon...	May 14, 1903.
	35.00	29.76	5.24	T. J. Mooney & Co. ....	Thomas...	Sept. 4, 1902.
	50.00	51.31	(c)	John Gaghan & Co. ....	Lanigan...	July 22, 1902.
	40.00	41.15	(d)	W. D. Sullivan .....	do	Dec. 4, 1902.
	60.00	52.69	7.31	B. & O. R. R. Co. ....	do	June 22, 1903.
		(e)			Prince...	
	50.00	60.29	(f)	Jas. M. Johnson .....	Lanigan...	Dec. 9, 1902.
	40.00	42.55	(g)	Appleton P. Clarke, jr. ....	do	Nov. 11, 1902.
	35.00	35.00		Chas. Rauscher .....	Prince...	Sept. 10, 1902.
1	81.00	32.14	48.86	James Nolan & Sons .....	Ward .....	Mar. 17, 1903.
		(e)	(h)	Gen. Anson Mills. ....	Lanigan...	
	50.00	12.19	37.81	Saml. H. Bacon .....	do	July 8, 1902.
	50.00	17.10	32.90	Upton H. Ridenour .....	do	Sept. 2, 1902.
	45.00	39.79	5.21	Robt. B. Caverly .....	Thomas...	Oct. 6, 1902.
	45.00	40.11	4.89	F. T. Sanner .....	Lanigan...	Oct. 22, 1902.
1	196.00	191.70	4.30	W. H. Goines, chairman board trustees.	Ward .....	*Aug. 6, 1903.
2	1,302.00	1,436.18	174.52			

g Overrun (\$2.55) of the estimated cost charged to the appropriation for assessment and permit work, 1903.

A Work begun in fiscal year 1902.

f Making excavation in street to ascertain cause of apparent defective drainage of cellar under Commercial Hotel.

j Making excavation in street to ascertain cause of water in cellar of building.

\* Repairs to pavements made in fiscal year 1904.

TABLE 5.—Main

No. of order.	Location.	Pipe sewers laid (length in feet).			
		8-in.	10-in.	12-in.	15-in.
523	Reservation B .....				
561	B street SW., crossing First street .....				
524	Center street and Meridian avenue (southeast corner) .....			18	
542	C street SW., crossing Delaware avenue .....				
589	Champlain avenue NW., south of Superior street .....				
503	Connecticut and California avenues NW. (northwest and northeast corners) .....			45	
567	Columbia Road east of Eighteenth street .....			39	
569	Columbia Road west of Sixteenth street .....			21	
561	Columbia Road and Sixteenth street NW. (northeast corner) .....			24	
570	Columbia Road and Sixteenth street NW. (northwest corner) .....				12
572	Columbia Road east of Ontario avenue NW .....		8		
543	Delaware avenue SW., between B and C streets .....				525
549	D street NE., between Ninth and Tenth streets .....			48	
571	D street NE., crossing Eleventh street .....				45
509	Eleventh and Kenyon streets NW. (southwest corner) .....			9	
510	Eleventh and Kenyon streets NW. (northwest corner) .....			33	
511	Eleventh and Harvard streets NW. (southwest corner) .....			12	75
512	Eleventh and Dartmouth streets NW. (southwest corner) .....			33	
513	Eleventh and Wallach streets NW. (southwest corner) .....			12	
514	Eleventh and Wallach streets NW. (northwest corner) .....			15	
515	Eleventh and Princeton streets NW. (southwest corner) .....				33
516	Eleventh and Princeton streets NW. (northwest corner) .....				30
517	Eleventh and Irving streets NW. (southwest corner) .....			36	
518	Eleventh and Irving streets NW. (northwest corner) .....			33	
520	Eleventh and Harvard streets NW. (northwest corner) .....			3	
531	Eleventh and Columbia streets NW. (southwest corner) .....			3	
548	Eleventh street and Florida avenue NW. (northeast corner) .....			39	
555	Eighth and I streets SE. (northwest corner) .....			24	
504	F street NW., between Sixth and Seventh streets .....			88	
526	Fourteenth and Bacon streets NW. (southwest corner) .....			66	
529	First and U streets NW. (southeast corner) .....				6
537	Fifteenth street and Kentucky avenue SE. (intersection) .....	24			
538	First and O streets SE. (northwest corner) .....			15	
550	First street NW., between Pierce and M streets .....			42	
578	Fourth street NW., between R street and Florida avenue .....				205
585	Fourteenth street NE., north of East Capitol .....			54	
592	Florida avenue and Decatur street NW. (northwest corner) .....			3	
593	Fifth street NW., between F and G streets .....	12			
594	Fifth street NW., crossing F street .....				
595	Fifth street NW., between E and F streets .....				381
601	Fifteenth street SW., between C and D streets .....				
544	Georgia avenue and K street SE. ....			240	
567	G and One-half streets SW. (intersection) .....			12	
500	H street NE., between Thirteenth and Fourteenth streets .....				
501	H street NE., between Thirteenth and Fourteenth streets .....			523	
508	Half and M streets SW. (intersection) .....				57
534	H street NE., between Thirteenth and Fourteenth streets .....				21
581	H street NE., between Thirteenth and Fourteenth streets .....			144	
582	I street NW., crossing Thirteenth street .....				
568	K street SE., crossing Fourteenth street .....				
584	K street NE., crossing Sixth street .....			42	
528	L street NW., between Eighteenth street and Connecticut avenue .....			80	
530	Lincoln avenue NE., just north of T street .....				54
558	L street NE., west of Ninth street .....				3
573	L street SE., between Twelfth and Thirteenth streets and square 1023 .....			9	
532	Maryland avenue SW., east of Fourth street .....			3	
591	Massachusetts avenue and Decatur street NW. (northeast corner) .....			18	
576	Michigan avenue NE., 500 feet west Lincoln avenue .....				81
577	Michigan avenue NE., 500 feet west Lincoln avenue .....				
579	Morgan avenue and Lamont Place (southwest corner) .....			27	
564	N street SW., from Half street eastward .....			90	
574	North Capitol street, just north of W street .....			90	
580	New Hampshire avenue, between Whitney and Brightwood avenues .....			105	
505	Square 198 .....				186
506	Square 198 .....			15	
546	Square 195 .....			103	
552	Square 164 .....				97
569	Square 107 .....	96			
590	Park driveway, between Seventh and Fourteenth streets .....			117	
519	Second street SE., between E and F streets .....				

<sup>a</sup> Apparent excessive cost due to the fact that manhole was constructed for connections from basins on northwest and southwest corners. The labor on manhole was charged to job 513. The material was charged to job 514.

<sup>b</sup> Awaiting bill for repairs to pavements.

*e sewers.*

Sewers laid (length in feet).		Basins.	Man-holes.	Branches.	Cost of materials.	Cost of labor.	Cost of repairs to pavements.	Total cost.
21-in.	24-in.							
160			1	2	\$175.64	\$190.05	\$27.49	\$393.18
30					29.53	60.36		89.89
		1			27.37	40.05		67.42
	96		1		188.15	172.00	24.98	385.13
		1			28.82	32.40		61.22
		2			46.18	97.11		143.29
		1			48.62	61.24		109.76
		1			39.43	51.11		90.54
		1			48.46	55.37		103.83
		1	1		50.33	50.98		101.31
		1			20.07	41.29		61.36
			2	3	\$394.41	469.62		807.93
			1		43.76	40.24		84.00
			1		48.39	49.52	13.03	110.94
					23.98	29.87		53.85
		1			33.38	35.22		68.60
		1	1		83.87	113.68		197.55
		1			32.86	39.36		72.22
		1			24.41	a 43.86		78.27
		1	1		a 47.50	24.05		71.55
		1			36.48	31.60		68.08
		1			85.24	46.06		131.30
		1			33.33	41.50		74.83
		1			44.71	41.87		86.58
		1			19.88	25.22		45.05
		1			29.53	29.69	4.16	63.38
		1			34.80	62.75		97.55
		1			30.78	29.12	(b)	
				1	41.21	186.48	24.23	203.92
		1	1		76.73	113.80	27.62	218.05
		1			33.27	32.25		65.52
		1			27.49	44.63		72.12
		1			34.05	43.56		77.61
			2		59.74	82.33	14.31	156.38
			2	5	159.62	279.25	16.77	455.64
		1			50.52	46.06		96.58
		1			31.11	30.43		61.54
301			2	11	357.69	675.17	(b)	
			1	1	79.00	162.68	(b)	
			1	9	258.15	e 710.03	(b)	
			1		142.46	303.94		(d)
		6	3		288.91	270.62		559.53
			1		53.34	57.11	13.16	123.61
54					53.93	96.53	16.62	167.08
			2	14	296.41	479.19	c 68.93	843.53
			1		51.18	70.29		121.47
		1			31.80	32.74	13.92	78.46
	75		1	6	85.81	239.60	14.77	340.18
					90.29	119.90	73.81	284.00
			1		57.65	115.62		173.27
48			1		88.64	158.89	3.46	250.99
			1					
		2		7	108.12	214.07	f 24.25	346.44
		1			87.37	73.24	.96	161.56
					29.93	44.35		74.28
		1	2		266.18	764.65	160.17	1,191.00
		1			23.94	18.13		42.07
		1						
		2			35.55	39.75		75.30
					106.59	98.26		204.85
			1		106.10	148.05		254.15
					39.87	34.62		74.49
					40.50	86.31	16.80	143.61
		2			99.00	125.46		224.46
		2			102.13	102.16		204.29
			1	3	132.18	213.73		345.91
					24.73	37.05		61.78
			2	2	92.64	270.29	71.66	434.59
					125.24	365.05	(b)	
			1	6	52.81	94.04	16.17	163.02
		6			218.03	161.49		379.52
			2		247.60	394.76	53.82	696.18

e Includes \$20.93 cost of work by plumber.

d Work completed in fiscal year 1904.

e Includes \$37.01 cost of work by plumber.

f Includes \$1.90 cost of work by plumber.

TABLE 5.—Main and

No. of order.	Location.	Pipe sewers laid (length in feet).			
		8-in.	10-in.	12-in.	15-in.
521	S street, between Nineteenth and Twentieth streets .....	.....	.....	.....	.....
525	Second and E streets SE. (northeast corner) .....	.....	.....	3	.....
527	Second and N streets SE. <sup>a</sup> .....	.....	.....	.....	.....
533	Sheridan street and Piney Branch road .....	.....	.....	27	.....
536	Seventeenth street and Pennsylvania avenue NW .....	.....	.....	39	.....
541	Seventeenth and B streets NW. (southwest corner) .....	.....	.....	30	.....
547	S street NW, crossing Nineteenth street .....	.....	.....	9	.....
556	Seventeenth street SE, between A and B streets .....	.....	.....	.....	.....
563	Second and M streets SW. (northwest corner) .....	.....	42	.....	.....
596	Sheridan street NW, just east of Brown street .....	30	91	.....	.....
602	Seventh and I streets NE. (northeast corner) .....	.....	.....	6	.....
560	Sixteenth street NW, south of Kenesaw avenue .....	.....	.....	30	.....
575	Sixteenth and Grant streets NW .....	.....	.....	138	.....
502	Square 1003 <sup>b</sup> .....	.....	151	.....	.....
507	Third street SW, crossing O street .....	.....	.....	.....	.....
535	Thirteenth street NW, between E and F streets .....	.....	.....	.....	176
553	Twelfth and L streets SE. (northeast and northwest corners) .....	.....	.....	54	.....
504	Square 265 .....	69	.....	.....	.....
563	Twelfth and Austin streets NE. (northeast and southeast corners) .....	.....	.....	60	.....
565	Tenth street NE., between D and E streets .....	.....	.....	24	.....
566	Square 1009 .....	.....	.....	195	.....
c 584	Tenth street NE., just north of I street .....	.....	.....	15	.....
586	Tenth and K streets NE. (southeast corner) .....	.....	.....	30	.....
587	Tenth and K streets NE. (northwest corner) .....	.....	.....	12	.....
588	Tenth and K streets NE. (northeast corner) .....	.....	.....	33	.....
599	Tenth and E streets NE. (southeast corner) .....	.....	.....	6	.....
600	Tennessee avenue and E street NE. (intersection) .....	.....	.....	.....	37
622	U street NW, between Thirteenth and Fourteenth streets .....	.....	.....	.....	.....
539	Virginia avenue and C street NW. (intersection) .....	.....	.....	24	.....
540	Virginia avenue NW, just north of B street .....	.....	.....	9	.....
545	Whitney avenue and Eleventh street (northwest and northeast corners) .....	.....	.....	90	.....
562	Water street NW, between Twenty-fourth and Twenty-sixth streets .....	.....	.....	.....	.....
	Total .....	99	419	3, 162	2, 044

<sup>a</sup> Fifty-five corner and 46 side artificial basin tops constructed.<sup>b</sup> Work begun in fiscal year 1902.

pipe sewers—Continued.

Pipe sewers laid (length in feet).			Basins.	Man-holes.	Branches.	Cost of materials.	Cost of labor.	Cost of repairs to pavements.	Total cost.
18-in.	21-in.	24-in.							
407			1	2	17	\$295.67	\$356.35	\$14.01	\$1,166.08
						31.10	27.94		59.08
						289.85	217.56		500.91
			1			31.45	42.70		74.15
			1			43.14	55.67		98.81
			1			32.69	51.05		83.74
		48				60.62	156.80	17.67	284.99
420				1	8	312.84	806.18		1,121.02
			1			33.15	30.74		63.89
				1	2	94.80	116.29		211.09
			1			31.84	31.89		63.23
			1			43.50	50.33		93.83
			4			164.39	219.23		383.62
				2	14	103.80	249.35	313.82	666.97
45						33.09	62.60		95.69
		21		1	7	152.99	329.86	87.04	569.89
			2			71.34	85.47		156.81
						17.50	42.79		60.29
			2			84.42	112.54		196.96
						11.09	15.13	.96	27.18
				1		100.16	241.20		341.86
			1			24.47	31.12		55.59
			1			30.20	27.93		58.13
			1			24.20	32.89		57.09
			1			31.68	37.06		68.74
			1			21.13	30.18		51.31
				1		56.87	75.59		132.46
285				1	9	240.01	401.96	d 64.92	706.89
			1			37.31	45.94		83.25
			1			33.14	37.00		70.14
			2			71.91	110.76		182.67
105		177		2		320.81	439.22		760.08
2,174	593	417	81	52	124	8,909.33	14,672.01	1,199.40	21,541.43

c Awaiting bill for repairs to pavements.

d Includes \$11.23 cost of work by plumber.

TABLE 6.—Suburban

No. of order.	Location.	Pipe sewers laid (length in feet).				
		6-inch.	8-inch.	10-inch.	12-inch.	15-inch.
813	Arizona avenue, about 500 feet north of Canal road .....	.....	.....	.....	.....	.....
816	Baltimore street, between Nineteenth and Twentieth streets NW. ....	.....	.....	.....	57	.....
843	Brightwood avenue at Harvard street .....	.....	.....	.....	.....	.....
802	Carroll avenue crossing, right of way Baltimore and Ohio R. R. Co. ....	.....	.....	66	.....	.....
806	Central avenue NW., between Huron street and Columbia road. ....	.....	.....	.....	150	.....
808	Champlain avenue and Columbia road, between Erie street and Ontario avenue. ....	.....	.....	.....	228	.....
822	Columbia road and Sixteenth street NW. (intersection) .....	.....	.....	.....	.....	.....
823	Columbia road and Sixteenth street NW. (intersection) .....	.....	.....	.....	.....	.....
834	Connecticut avenue, between Columbia road and California avenue, NW. ....	.....	.....	.....	174	.....
807	Decatur street crossing, Florida ave. ....	.....	.....	.....	.....	.....
821	Decatur street, between Twenty-second street and Massachusetts avenue. ....	.....	.....	30	.....	.....
817	Eleventh street, between Kenyon and Dartmouth streets. ....	.....	.....	.....	.....	.....
818	Eleventh street, between Dartmouth street and Whitney avenue. ....	.....	.....	.....	.....	.....
826	Eighteenth street, between Lowell and Milwaukee streets. ....	.....	.....	.....	24	186
836	Eleventh and Wallach streets, between Eleventh street and Sherman avenue. ....	.....	.....	.....	39	.....
801	Franklin street, from Nichols avenue southward .....	.....	.....	.....	225	.....
819	First street NW., between W and Albany streets .....	.....	.....	.....	.....	387
803	Harvard street NW., between Sherman avenue and Eleventh street. ....	.....	.....	.....	.....	.....
827	Hancock street NW., between Brightwood and Warder avenues. ....	.....	.....	.....	.....	.....
824	Indianapolis street NE., between Seventh and Eighth streets. ....	.....	.....	.....	.....	.....
809	Kalorama and Connecticut avenues (intersection) .....	.....	.....	.....	240	.....
838	King street NE., between Trinidad street and Bladensburg road. ....	.....	.....	.....	.....	.....
837	Levis street NE., between Trinidad street and Bladensburg road. ....	.....	.....	.....	.....	.....
804	Massachusetts avenue and Decatur street NW. (intersection). ....	.....	.....	.....	18	.....
815	Marshall street NW., between Sherman avenue and Eleventh street. ....	.....	.....	.....	.....	.....
826	Marshall street NW., crossing Brightwood avenue. ....	.....	.....	.....	63	.....
830	McClellan street NW., between Brightwood and Warder avenues. ....	.....	.....	.....	.....	297
831	McClellan street NW., between Brightwood and Warder avenues. ....	.....	.....	.....	.....	555
833	Michigan avenue, west of Lincoln avenue. ....	.....	.....	.....	.....	.....
800	Nichols avenue, between Franklin street and Howard avenue. ....	.....	.....	.....	.....	336
812	New Hampshire, Whitney, and Sherman avenues (intersection). ....	.....	.....	.....	69	57
806	Ontario avenue, between Erie street and Columbia road. ....	.....	.....	.....	129	342
814	Pierce street, between Harrison and Jackson streets. ....	.....	.....	.....	115	.....
832	Pierce Mill road, west of Connecticut avenue. ....	.....	.....	.....	.....	.....
835	Pierce Mill road, between National Bureau of Standards and Connecticut avenue. ....	.....	1,017	.....	.....	.....
840	R street NE., between Fourth and Fifth streets. ....	.....	.....	.....	.....	.....
842	R street NE., between Third and Fourth streets. ....	.....	.....	.....	.....	.....
829	Steuben street NW., from Brightwood avenue eastward. ....	.....	.....	.....	.....	303
839	S street NE., between Fourth and Fifth streets .....	.....	.....	.....	.....	.....
841	S street NE., between Third and Fourth streets .....	.....	.....	.....	.....	.....
820	Sixteenth street NE., from Rosedale street southward. ....	.....	.....	.....	72	.....
828	Sixteenth street NW., from Kenesaw avenue southward. ....	.....	.....	.....	164	.....
810	T street NE., between Fourth and Fifth streets .....	.....	6	.....	.....	.....
811	Wyoming avenue NW., between Nineteenth and Twentieth streets. ....	12	.....	.....	.....	.....
	Total .....	12	1,023	96	1,767	2,463

sewers.

Pipesewers laid (length in feet).			Man-holes.	Branches.	Cost of materials.	Cost of labor.	Cost of repairs to pavements.	Total cost.	Remarks.
18-inch.	21-inch.	24-inch.							
					\$7.10	\$18.00		\$25.10	1 weir dam constructed.
			1		53.40	122.82	\$48.08	224.30	
						46.91			Work completed in fiscal year 1904.
			1		53.85	132.12		185.97	
			1		87.00	243.26		330.26	
			1		115.63	298.93		414.56	
189					141.69	291.19		432.88	
		138	1		185.38	251.80		437.18	
			1		98.12	163.60			Awaiting bill for repairs to pavements.
39			1		50.86	71.39		122.25	
					11.76	23.08		34.84	
	357		1		362.84	450.24		813.08	
428			1	1	328.51	524.22		852.73	
			1		131.28	242.78	22.83	396.89	
33			1		68.26	91.24		159.50	
			1		123.66	199.07	10.59	333.32	
			3		292.03	498.88		790.93	
357			2		291.65	359.48		651.13	
533			2	1	431.03	568.01		999.04	
	341		1	1	353.59	603.32		956.91	
			2		148.78	245.17	53.41	447.36	
264					182.78	507.97		690.75	
270			1		207.81	515.59	4.43	727.83	
66			2		108.82	167.52		276.34	
		432	2		550.85	578.28		1,129.13	
			1		55.03	82.08	8.31	145.42	
			1		186.04	322.59		508.63	
			2	3	378.67	874.56		1,253.23	
			1		222.64	26.88		249.52	Digging test holes.
						390.88	33.39	424.27	
			2		123.35	169.06		292.41	
			2		287.69	425.49		713.18	
				2	51.31	84.09	10.51	145.91	
						8.50		8.50	
			4		346.58	720.48		1,067.06	Do. Work performed for and at the expense of the Treasury Department.
		267	1		336.78	371.71	14.84	723.33	Repairs to pavements made in fiscal year 1904.
	168		1		208.36	305.16	6.26	519.78	Do.
			1		187.68	300.74		488.42	
	84	246	2		432.55	549.92	17.73	1,000.20	
398			2	7	324.45	467.28	a 41.22	832.95	
					31.73	54.55		86.28	
				1	73.98	313.86		387.84	
		273	2		371.54	480.64	24.22	876.40	
					2.84	9.31	3.97	16.12	
2,577	950	1,356	49	16	8,007.92	13,172.65	299.79	21,471.73	

a Includes \$27.42 cost of work, by plumber.

TABLE 7.—

No. of order.	Location.	Pipe sewers laid (length in feet).				
		6-inch.	10-inch.	12-inch.	18-inch.	24-inch.
1001	Florida avenue and V street NW. (intersection) .....			18		
1033	Industrial Home School.....	150				
1017	Joliet street NW. crossing Arizona avenue.....					21
1043	North Capitol street between Randolph and Seaton ..					
1018	Pennsylvania avenue between First and Seventeenth streets NW. <sup>a</sup>					
1032	Sixteenth street (old) north of Kenesaw avenue.....			12		
b 173	Square 255 <sup>c</sup> .....					
1003	Third street and Pennsylvania avenue SE.....			3		
1016	Reservation No. 13 <sup>d</sup> .....			330		
1041	Twenty-second and Decatur streets NW. (northeast and northwest corners).....					
1025	Various locations <sup>e</sup> .....					
1037	New York avenue and H street NW. (intersection)....			24		
1000	Seventeenth and F streets NW. (northwest corner)....					
1031	Eighth street between Pennsylvania avenue and L ..			30		
1028	H street NE. between North Capitol and First streets ..			21		
1030	K street N.W. between Seventh and Ninth streets ..			108		
1015	Massachusetts avenue NW., just east of Twenty-first street.....			18		
1029	Ninth and M streets NW. (northwest corner).....			24		
1024	Q street and Columbia road NW. (southwest corner) ..			3		
1023	Seventeenth and B streets NW. (northwest corner) ..				9	
1006	Third and L streets NW. (northeast and northwest corners).....			9		
1019	Virginia avenue and D street NW. (intersection) .....			9		
1022	Virginia avenue between Eighteenth and Twentieth streets NW.....					
1012	Fourteenth and G streets NE. (southwest corner) .....			18		
1039	Fifteenth and G streets NE. (southwest corner) .....			15		
a 1040	Fifteenth and G streets NE. (northwest corner) .....					
1011	G and Florence streets NE. (southwest corner).....			9		
1004	Ninth and B streets NE. (southeast corner).....					
1005	Ninth and B streets NE. (northeast corner).....			3		
1046	Seventh and H streets NE. (northeast corner).....			3		
1047	Seventh street NE., just north of H street <sup>f</sup> .....					
1034	Tenth and B streets NE.....			48		
1035	Tenth and H streets NE. (northeast corner).....					
1036	Tenth and I streets NE. (northeast corner).....			3		
1045	Tenth and Maryland avenue NE. (southwest corner) ..		9			
1007	Fifth and E streets SE. (northeast corner south roadway).....			15		
1008	Fifth and E streets SE. (northeast corner north roadway).....			3		
1009	Fifth and E streets SE. (southeast corner north roadway).....					
1010	Seventh and E streets SE.....			3		
1013	Third and G streets SE. (northeast corner) .....			9		
1014	Third and G streets SE. (southeast corner) .....			9		
1026	Delaware avenue and C street SW. (northwest corner) ..			21		
1027	Delaware avenue and C street SW. (northeast corner) ..			21		
1021	South Capitol and C streets (northeast corner) .....					
1040	Sherman avenue between Irving and Harvard streets ..			30		
1044	Piney Branch road and Howard avenue (northeast corner).....					
1038	M street SW., just east of James Creek Canal.....			21		
1002	Sewerage pumping station <sup>g</sup> .....					
1020	Second and N streets SE. <sup>h</sup> .....					
i A	Various locations.....	3	8 inch.	9	4-inch lead pipe.	
i B	East side Thirteen-and-a-half street SW., just south of B street.....		6		47	
			3		20	

<sup>a</sup> Roping Pennsylvania avenue NW. between First and Seventeenth streets for G. A. R. Encampment, 1902, parade.

<sup>b</sup> Assessment.

<sup>c</sup> Digging test holes.

<sup>d</sup> Also constructed 84 linear feet of 3-inch water main, 85 linear feet 6-inch cast-iron drain, 100 linear feet 5-inch cast-iron drain, 85 linear feet 4-inch cast-iron drain, and 60 linear feet 3-inch cast-iron drain.

Miscellaneous.

Basins abandoned.	Basins adjusted.	Branches.	Manholes.	Basins reconstructed.	Basins.	Cost of materials.	Cost of labor and contingencies.	Cost of repairs to pavements.	Total cost.	Appropriation.
					1	\$26.31	\$59.51		\$85.82	Sidewalks and curbs, 1902.
						28.51	138.41		166.92	Pumping plant for sewage, Industrial Home School.
	3				2	77.67	98.39		176.06	Improvement, Joliet street.
						15.94	15.94		15.94	Paving North Capitol street, 1903.
						75.28	542.06		617.33	Preservation public order, G. A. R. Encampment, 1902.
					1	30.57	62.49		93.06	Widening and macadamizing Sixteenth street, Columbia road, and Park street.
						83.16	866.08		944.24	Municipal building.
					1	12.11	33.16		45.27	Replacing sidewalks and curbs.
	5	2				407.11	422.61		829.72	Erection workhouse for males.
	2						9.78		9.78	Paving Decatur street, 1903.
							70.97		70.97	Construction and maintenance public comfort stations.
					1	37.62	46.91		84.53	Sidewalks and curbs, 1903.
					1	19.62	35.68		55.30	Do.
					8	189.54	330.87	\$4.35	524.76	Repairs to streets, 1903.
					1	33.91	46.90		80.81	Do.
					2	88.24	164.45		252.69	Do.
					1	24.99	41.93		66.92	Do.
					1	30.45	59.98		90.43	Do.
					1	20.83	28.48		49.31	Do.
					1	28.07	37.41		65.48	Do.
					2	43.23	66.11		109.34	Do.
					1	21.04	38.98		60.02	Do.
4							10.56		10.56	Do.
					1	27.09	39.22		66.31	Improvements and repairs northeast section, 1903.
					1	24.78	32.72		57.50	Do.
					1	18.96	34.10		53.06	Do.
					1	21.69	23.93		45.62	Do.
					1	20.01	26.99		47.00	Do.
					1	20.83	29.93		50.76	Do.
					1	28.90	35.69		64.59	Do.
							27.44		27.44	Do.
					3	80.86	140.39		221.25	Do.
					1	30.40	31.94		62.34	Do.
					1	22.35	32.01		54.36	Do.
					1	26.60	26.31		52.91	Do.
					1	23.09	25.78		48.87	Improvements and repairs southeast section, 1903.
					1	20.83	23.32		44.15	Do.
					1	19.94	31.04		50.98	Do.
					1	20.21	28.28		48.49	Do.
					1	22.32	36.68		59.00	Do.
					1	15.84	36.25		52.09	Do.
					1	17.76	30.33		48.09	Paving South Capitol street and Delaware avenue between B and C streets.
					1	29.96	28.66		58.62	Do.
					1	29.88	28.91		58.79	Do.
					4	97.51	180.27		277.78	Repairs to roads, 1903.
					1	22.98	28.18		51.16	Do.
					2	49.38	44.13		93.51	Improvements and repairs southwest section, 1903.
						65.16				Sewerage pumping station.
						151.35	79.76		231.11	Do.
					Flushing basins.					
					6	284.41	468.59		853.00	
					1	71.63	79.74	8.15	159.52	

- \* Connecting public-comfort stations.
- † Work completed in fiscal year 1904.
- ‡ Constructing box drain and connections.
- § Discharge channel constructed.
- ¶ Siphons.

## 72 OPERATIONS OF THE ENGINEER DEPARTMENT, D. C.

TABLE 8.—Average cost of materials and labor per linear foot of pipe sewers constructed by day labor, also average cost of basins.

[In this table it is assumed that the cost of materials used in basin connections is the same as that in the same size sewer. It is also assumed that on account of the difference in the depth of excavation the cost of labor is half the cost as that of the same size sewer. This table does not embrace the cost of work of exceptionally difficult construction.]

Size of sewers.	Length.	Cost of materials.	Cost of labor.	Total cost.
	<i>Feet.</i>	<i>Per foot.</i>	<i>Per foot.</i>	<i>Per foot.</i>
8-inch.....	1,828	\$0.358+	\$0.804+	\$1.162
10-inch.....	5,847	.531—	1.031—	1.562
12-inch.....	20,184	.539+	1.093—	1.632
15-inch.....	4,242	.726+	1.32—	2.046
18-inch.....	4,496	.807—	1.518—	2.325
21-inch.....	1,543	1.061—	1.57—	2.631
24-inch.....	1,902	1.32+	1.742—	3.062
8-inch connection.....	30	.358+	.402	.76
10-inch connection.....	91	.531—	.516	1.047
12-inch connection.....	2,313	.539+	.547	1.086
15-inch connection.....	324	.726+	.66	1.386
18-inch connection.....	278	.807—	.759	1.566
Basins constructed.....	144	22.214+	33.338—	55.552

TABLE 9.—Number of foremen, inspectors, and other employees of the sewer division, office of the chief clerk, engineer department, disbursing officer, inspector of asphalts and cements, and of the engineer-department stables, temporarily employed, and appropriations from which paid, for the fiscal year ending June 30, 1903.

[This table does not include the hire of carts, wagons, and teams.]

	Foremen.	Inspectors.	Other employees.	Total.
Number employed.....	11	23	305	339
	<i>Dollars.</i>	<i>Dollars.</i>	<i>Dollars.</i>	<i>Dollars.</i>
Cleaning and repairing sewers and basins.....	6,700.64	264.00	53,581.60	40,546.24
Main and pipe sewers.....	1,157.00	885.50	13,437.71	15,480.21
Suburban sewers.....	1,084.00	965.50	12,487.77	14,537.27
Assessment and permit work and whole cost to applicant.....	2,076.00	1,476.47	22,379.27	25,931.74
Sewerage, pumping station.....	20.00	1,323.50	4,270.96	5,614.46
East side to Twelfth street.....		3,087.50	1,143.66	4,231.16
Georgetown trunk sewer.....		820.00	497.63	1,317.63
Extension of boundary sewer.....		1,217.00	865.25	2,082.25
Low area trunk sewer.....		1,725.75	1,297.87	3,023.62
B street and New Jersey avenue trunk sewer.....		1,236.00	1,081.56	2,317.56
Main through lands of Davidge and Trinity College.....		284.00		284.00
Unused balances.....		185.00		185.00
Sidewalks and curbs.....	16.00		89.03	105.03
Improvement and repairs, northeast section.....	52.00		241.05	293.05
Improvement and repairs, southeast section.....	19.00		83.69	102.69

	Foremen.	Other employees.	Total.
Improvement and repairs southwest section.....	\$4.00	\$23.56	\$27.56
Repairs to streets.....	93.50	460.09	553.59
Repairs to roads.....	19.00	107.35	126.35
Erection of workhouse for males.....	36.50	306.69	343.19
Improving Joliet street.....	6.00	60.88	66.88
Temporary public-comfort stations.....	6.50	46.13	52.63
Paving South Capitol street and Delaware avenue between B and C streets.....	11.00	54.22	65.22
Widening and macadamizing Sixteenth street between Columbia road and Park street.....	10.00	37.99	47.99
Pumping plant for sewerage disposal, Industrial Home School.....	20.00	88.10	108.10
Roping Pennsylvania avenue, police and firemen parade.....	2.75	.77	3.52
Preservation public order, G. A. R. encampment, 1902.....	86.00	300.24	386.24
Municipal building.....	34.00	219.70	253.70
Paving North Capitol street.....	2.00	7.81	9.81
Automatic flushing tanks.....	77.00	278.28	355.28
Paving Decatur street.....	1.00	5.56	6.56

# OPERATIONS OF THE ENGINEER DEPARTMENT, D. C. 73

WASHINGTON, September 25, 1903.

SIR: I have the honor to submit the following tabulated statement of the amount of conduits laid during the fiscal year ending June 30, 1903, together with a summary of conduits constructed to June 30, 1903.

Very respectfully,

GEO. W. WALLACE,  
Inspector, Sewer Division.

Mr. D. E. McComb,  
Superintendent of Sewers, District of Columbia.

TABLE 10.—Amount of conduits laid from July 1, 1902, to June 30, 1903.

No. of duct.	United States Electric Lighting Co.		Potomac Electric Power Co.		District of Columbia, <sup>a</sup>	
	Conduit.	Duct.	Conduit.	Duct.	Conduit.	Duct.
	Feet.	Feet.	Feet.	Feet.	Feet.	Feet.
4	9,964	39,856	14,007	56,028		
8			10	80		
12			597	7,164		
32			77	2,464		
Total	9,964	39,856	14,691	65,736		

No. of duct.	United States Government.		Chesapeake and Potomac Telephone Co.		Total.	
	Conduit.	Duct.	Conduit.	Duct.	Conduit.	Duct.
	Feet.	Feet.	Feet.	Feet.	Feet.	Feet.
2			37,803	75,606	37,803	75,606
4	106	424	39,970	159,880	64,047	256,188
6			18,521	111,126	18,521	111,126
8			14,297	114,376	14,307	114,456
10			5,022	50,220	5,022	50,220
12			3,253	39,036	3,850	46,200
14			1,400	19,600	1,400	19,600
16			779	12,464	779	12,464
20			1,381	27,620	1,381	27,620
22			823	18,106	823	18,106
30			313	9,390	313	9,390
32					77	2,464
72			42	3,024	42	3,024
Total	106	424	123,604	640,448	148,365	746,464

<sup>a</sup> For amount of conduit laid by the District of Columbia, see electrical engineer's report.

## NUMBER OF MANHOLES AND HANDHOLES BUILT.

	Manholes.	Handholes.
United States Electric Lighting Co.....	25	38
Chesapeake and Potomac Telephone Co.....	206	
Potomac Electric Power Co.....	58	152

# 74 OPERATIONS OF THE ENGINEER DEPARTMENT, D. C.

## SUMMARY OF CONDUITS CONSTRUCTED TO JUNE 30, 1903.

No. of duct.	United States Electric Lighting Co.		Chesapeake and Potomac Telephone Co.		Potomac Electric Power Co.	
	Conduit.	Duct.	Conduit.	Duct.	Conduit.	Duct.
	<i>Feet.</i>	<i>Feet.</i>	<i>Feet.</i>	<i>Feet.</i>	<i>Feet.</i>	<i>Feet.</i>
1.....	26,177	26,177	15,596	15,596	1,557	1,557
2.....	128,223	256,446	42,157	84,314	766	1,532
3.....	236	708				
4.....	88,296	353,184	40,630	162,520	20,058	80,212
6.....	35,461	212,766	41,706	250,236	9,488	56,928
7.....			82	574		
8.....	11,818	94,544	32,387	259,096	8,644	69,132
9.....			114	1,026	7,288	65,502
10.....	88	880	5,022	50,220		
12.....	1,491	17,892	8,216	98,592	28,576	462,912
13.....			212	2,756	374	4,862
14.....	1,224	17,136	1,400	19,600		
15.....	68	1,020				
16.....	2,793	44,688	6,604	105,664	1,314	21,024
17.....			636	10,812		
18.....			1,576	28,368		
20.....			1,407	28,140	85	1,700
22.....			823	18,106		
24.....	2,435	58,440	2,072	49,728		
25.....			304	7,600		
28.....	2,049	57,372				
30.....	53	1,590	813	9,390		
32.....			485	15,520	77	2,464
36.....	3,854	138,744	26	936		
40.....			1,589	63,560		
44.....					424	18,656
56.....			749	41,944		
58.....					7	408
64.....	106	6,784	176	11,264		
72.....			118	8,496		
Total.....	304,372	1,288,371	204,400	1,344,058	88,653	786,987

No. of duct.	Brightwood Rwy. Co.		District of Columbia.		Private conduits.	
	Conduit.	Duct.	Conduit.	Duct.	Conduit.	Duct.
	<i>Feet.</i>	<i>Feet.</i>	<i>Feet.<sup>a</sup></i>	<i>Feet.</i>	<i>Feet.</i>	<i>Feet.</i>
1.....			6,568	6,568	30	30
2.....	18	26	80	160	227	454
4.....			44	176		
6.....			711	4,266		
8.....	176	1,408				
Total.....	189	1,434	7,403	11,170	257	484

No. of duct.	Postal Telegraph and Cable Co.		United States Government.		Anacostia and Potomac River R. R. Co.		Capital Traction Co.	
	Conduit.	Duct.	Conduit.	Duct.	Conduit.	Duct.	Conduit.	Duct.
	<i>Feet.</i>	<i>Feet.</i>	<i>Feet.</i>	<i>Feet.</i>	<i>Feet.</i>	<i>Feet.</i>	<i>Feet.</i>	<i>Feet.</i>
1.....	13,236	13,236						
2.....							15,742	31,484
4.....	1,427	5,708	1,357	5,428	176	704	8,720	34,880
6.....							7,320	43,920
7.....							29	208
8.....					159	1,272	2,761	22,088
10.....					245	2,450		
14.....							4,257	50,506
22.....							9,109	200,336
26.....							280	7,280
Total.....	14,663	18,944	1,357	5,428	580	4,426	43,218	309,551

<sup>a</sup>This does not include conduits laid this year by District of Columbia (see electrical engineer's report).

## SUMMARY OF CONDUITS CONSTRUCTED TO JUNE 30, 1903—Continued.

No. of duct.	Metropolitan R. R. Co.		City and Suburban Rwy. Co.		Total.	
	Conduit.	Duct.	Conduit.	Duct.	Conduit.	Duct.
	<i>Feet.</i>	<i>Feet.</i>	<i>Feet.</i>	<i>Feet.</i>	<i>Feet.</i>	<i>Feet.</i>
1					6,568	6,568
2					187,208	374,416
3					236	708
4	21,661	86,644	11,040	44,160	193,404	773,616
6			5,117	30,702	99,803	598,818
7					111	777
8			13,248	105,984	69,193	553,554
9					7,402	66,618
10			8,080	80,300	13,885	188,850
12	11,381	136,572	77	924	59,741	716,892
13					586	7,618
14			1,880	26,820	8,761	122,654
15					68	1,020
16					10,711	171,376
17					636	10,812
18			2,214	39,852	8,790	68,220
20					1,492	29,940
22			134	2,948	10,066	221,452
24					4,507	108,168
25					904	7,600
26					280	7,280
28			87	2,436	2,136	59,808
30					366	10,980
32					562	17,984
36					3,880	139,680
38			193	7,334	198	7,334
40					1,589	63,560
44					424	18,656
56					749	41,944
58					7	406
64					282	18,048
72					118	8,496
Total.....	33,042	223,216	42,020	340,960	688,558	84,368,753

<sup>a</sup>These totals do not include amount of conduits laid this year by the District of Columbia.

## REPORT OF THE INSPECTOR OF PLUMBING.

WASHINGTON, D. C., August 20, 1903.

SIR: I have the honor to submit the annual report of the work performed by this office for the fiscal year ending June 30, 1903.

The office was under the direction of Mr. O. L. Ingalls until December 1, 1902, when he resigned in order to accept a responsible position in Manila, and on that date I was appointed to the office made vacant by Mr. Ingalls's resignation.

## INSPECTIONS.

During the fiscal year the total number of inspections made by this office was 25,298, being an increase of 2,677 over that of last year and 6,333 over that of the year previous.

These inspections, summarized, are as follows:

Examinations of existing plumbing of a preliminary nature .....	4,687
Inspections of remodeling extensions and repairs to old houses .....	7,640
Inspections of plumbing in new buildings.....	5,975
Inspections of gas and gas fixtures.....	1,293
Inspections of lead water-service pipes.....	759
Inspections of new terra-cotta house sewers .....	79
Inspections of repairs to terra-cotta sewers .....	702
Peppermint tests.....	2,268
Sewer taps into main sewers .....	905
Notices served on owners and plumbers.....	220
Examination on complaint.....	770

The greatest number of inspections made by any one man was 4,781, which would average over 14 each day.

By consulting the old records on file in this office it is found that the number of inspections has increased materially since the record has been kept, and will show a

## 76. OPERATIONS OF THE ENGINEER DEPARTMENT, D. C.

steady increase of inspections, even after the number of assistants had been increased to nine, and is one of the best arguments I can produce for an increase in the office force.

1893-94, 6 men, including inspector .....	5,708
1894-95, 6 men, including inspector .....	7,116
1895-96, 6 men, including inspector .....	8,677
1896-97, 7 men, including inspector .....	14,113
1897-98, 9 men, including inspector .....	17,550
1898-99, 9 men, including inspector .....	17,600
2 men, hydrant inspectors .....	5,800
1899-1900, 9 men .....	17,418
1900-1901, 9 men .....	18,965
1901-1902, 9 men .....	22,621
1902-1903, 9 men .....	25,298

### COMPLAINTS.

From the itemized list of inspections it will be seen that there were 770 cases of complaints. These are from defective plumbing and sewers, water in cellars, etc.

I regret to report that the owners and agents have not in some cases taken advantage of the courtesy I have tried to extend to them when letters have been sent them calling attention to defects in plumbing when complaint is made, thereby making it necessary for the service of an official order, and occasionally taking them into the police court when it was not complied with.

### OFFICE WORK.

Number of letters written, including miscellaneous .....	334
Number of indorsements on official papers .....	718
Number of letters to master plumbers .....	239
Number of orders to repair plumbing or gas fitting .....	607
Number of letters to Engineer Commissioner and other officials originating in this office .....	166
Number of plans for new buildings examined .....	1,384
Number of building-repair applications examined .....	1,968

### SCHOOL TOILET BUILDINGS AND ROOMS.

There are a number of school buildings having plumbing in bad condition, which should receive immediate attention, but on account of the small appropriation (\$25,000) it is impossible to change the defective and in some cases antiquated plumbing as rapidly as it should be done, and the office has therefore taken each year the most urgent cases and has installed complete plumbing systems, including fixtures for toilet rooms, drinking fountains, teachers' toilet rooms, and the necessary heating for the same where heating was not possible from the system in use. Last year's appropriation of \$25,000 was used in placing in the Amidon, Blair, Maury, Morse, Twining, and Wormley buildings complete plumbing systems, besides a new lead-water service in the Maury. New lead-water service was placed in the Curtis and Addison schools, and the same for the Reservoir School. Drinking fountains were placed in the Towers, Thompson, Berret, and Toner, and a single temporary fountain for the Colored High School, which will be replaced this year with a permanent system of drinking fountains on each floor.

### POLICE COURT CASES.

In 32 cases warrants were obtained for violation of the plumbing regulations, as follows:

By owners, 14; by plumbers, 7; by violation of the act, 9; by failure to obtain permits, 2; making in all 32 cases.

There were 16 cases nol-prossed because the work ordered was performed after warrant was sworn out (and in one case the offender was fined), as follows:

One case nol-prossed because work ordered was performed; 1 case for the violation of the regulations and 2 of the plumbing act were nol-prossed on the order of the Engineer Commissioner. There were 6 forfeitures of collateral for violation of the plumbing act and 2 cases nol-prossed because objectionable work was removed. One case was withdrawn because permit was obtained, and in another the offender was fined. In another case the person for whom warrant was sworn out could not be

apprehended. In one instance the person supposed to be the owner denied ownership in court, and on account of inability to find owner the case was nol-prossed. In one instance personal bond was taken for violation of the plumbing act, making in all 16 cases nol-prossed.

#### REVOCATION OF PLUMBER'S LICENSE.

During the year it was necessary for the office to recommend that the license of 4 plumbers be taken from them—2 for failure to provide the required bond; 1 for dilatory, unsatisfactory, and improper methods pursued in doing his work, and because he violated the plumbing regulations; and the other for doing defective work and covering same without inspection.

#### THE NECESSITY FOR PERMITS FOR ALL PLUMBING WORK.

The office is handicapped in not being in touch with all plumbing work which is installed in houses, and in some cases even in making extensions of existing plumbing on premises within the lot lines. I am of the opinion that the office can prevent work from being done by unregistered plumbers and in an unsatisfactory manner if permits were required in all instances as they are in the building department, except in very minor repairs, as the office never has knowledge of such work unless the work is reported for inspections, judging from defective fixtures and work found in some instances.

Unregistered plumbers are therefore enabled to do inside work, as no permits are required nor inspection made, thus defeating the object of the plumbing office, whose function is to see that the plumbing regulations are not violated nor the public defrauded by unscrupulous men whose work is never inspected and who have had their licenses taken from them on account of violation of the plumbing regulations and for doing defective work.

This would entail extra work on both this office and the permit office of the engineer department; but I believe such a requirement would be a benefit to the public, and would enable this office to keep in touch with all plumbing work, and would protect the public and the registered plumbers who are bonded and licensed to abide by the requirements of the plumbing regulations. If such a requirement is made and the cooperation of the police department obtained, the plumber would be required to exhibit a permit to the police for all kinds of plumbing work, and would necessarily keep the office informed of the character of work installed and by whom performed.

There is one class of inspection in which this office could obtain better results in the work if additional men were provided, and that is, plumbing installed in large apartment houses, offices, hotels, etc., where a great amount of work is in place before the office is called upon to inspect same. During the interval between inspections a great amount of work is done, and often very badly run lines of piping are in place, and unless it is obviously defective and contrary to the regulations, this office has to pass same, while if additional men were provided and the assistant inspectors instructed to visit these buildings whenever they feel the necessity to do so, their experience will enable them to point out better methods to be used in making connections, which sometimes are installed by journeymen plumbers without the care which should be observed in doing such important work.

Such inspections are impossible with the present office force on account of the great increase of requests for inspections at a specified time by the registered plumbers. I regret to say that the plumbers are often caused serious delays and financial loss by the inability of the assistant inspectors to reach their work at the time specified by them, on account of the great amount of work they were called upon to inspect this last year, and the large territories covered by them, and also from the fact that the work is often scattered so that much time is consumed in going to the various jobs reported for inspection. It is not infrequent that they are compelled to work overtime in making the inspections that have been ordered for the day, which they have done without complaint.

#### SUBURBAN HOUSE DRAINAGE.

This office, in conjunction with the health office, is frequently required to consider the disposal of waste or drainage in houses erected and proposed to be erected in the suburbs, either by sewage-disposal fields, subsoil drains, or cesspools, where sewers are not available, and as no two cases are alike, the owners are required to submit drawings and a description of the system for approval by the Commissioners.

In most cases the owner in building his house wishes to rough in for the soil and

vent stacks and necessary plumbing, so that when the public sewers are run in front of his premises suitable connection can be made thereto. In granting this privilege of connecting to this form of drainage it is given by the Commissioners with the distinct understanding that no water-closet is to be placed within the house until a sewer is provided in the street. Notwithstanding this stipulation, this privilege has been abused, but the offenders have been taken into police court and required to remove the fixtures.

I am of the opinion that the condition now existing can be relieved in the future if in all new subdivisions some temporary system of water main and sewerage are shown and provided on each approved subdivision. By so doing the owner of these subdivisions will be able to obtain better prices for the property, and the purchaser be provided with a system of waste disposal that will enhance the value of his holdings and besides provide the comforts of a city house in the suburbs, where he and his family can find the fresh air and advantages of suburban life.

In such growing sections as Brookland, Petworth, Tenleytown, Brightwood, Cleveland Park, and others, where the separate system is in operation, I trust that the present system can be extended and that all suburban villages within the District of Columbia can be provided with at least some temporary sewer system until the permanent sewer system can be extended to serve the houses in these localities.

#### PUBLIC COMFORT STATIONS.

It seems hardly necessary to call attention to this important necessity in a city where the population is over 275,000 and is often increased materially by an influx of visitors who are with us in numbers at all times, and who are sure to be here in great numbers every inauguration and whenever there is a convention.

A such times it is necessary for the city to provide temporary facilities, and even these crude conveniences are patronized, thus showing the need of at least three public comfort stations of a permanent character, which should be located on the reservations along Pennsylvania avenue and built either of the underground type or partly above the surface.

Respectfully submitted.

H. B. DAVIS,  
*Inspector of Plumbing.*

Maj. JOHN BIDDLE,  
*Corps of Engineers, U. S. Army,*  
*Engineer Commissioner, District of Columbia.*  
(Through Capt. Chester Harding.)

#### REPORT OF THE PLUMBING BOARD.

WASHINGTON, D. C., August 19, 1903.

SIR: I have the honor to submit the following statement of the work of the plumbing board during the fifth year of its organization:

There were held during the year 26 sessions, all of which were devoted to the examination of candidates for master plumbers' and gas fitters' licenses, and the preparation of questions for said examinations.

The total number of examinations conducted was 42. The number of original candidates examined was 30, of whom 23 passed. The number of those reexamined was 12, of whom 6 passed.

The following changes in the personnel of the board were ordered by the Commissioners, District of Columbia: Mr. J. R. Quinter, master plumber, whose term expired June 30, 1902, was reappointed a member for a period of two years; Mr. Patrick J. Brick, journeyman plumber, was appointed a member July 7, 1902, for a period of two years, vice J. Carl Darnall, resigned.

T. V. NOONAN, *President.*  
RICHARD A. O'BRIEN, *Secretary.*

Maj. JOHN BIDDLE,  
*Corps of Engineers, U. S. Army,*  
*Engineer Commissioner, District of Columbia.*  
(Through Capt. Chester Harding.)

## REPORT OF THE INSPECTOR OF BUILDINGS.

WASHINGTON, August 26, 1903.

SIR: I have the honor to submit herewith the annual report covering the transactions of the building department for the fiscal year ending June 30, 1903, together with recommendations for the fiscal year ending June 30, 1905.

*Statement of permits issued from June 30, 1902, to July 1, 1903.*

	Num-ber.	Value.		Num-ber.	Value.
Brick dwellings .....	938	\$4,100,656	Churches .....	6	\$190,500
Frame dwellings .....	172	301,637	Stables (brick) .....	40	87,275
Brick repairs .....	938	1,593,570	Stables (frame) .....	17	6,355
Frame repairs .....	506	117,466	Carriage repository .....	1	9,000
Apartment houses .....	40	2,646,500	Hospital .....	1	70,000
Stores and dwellings (brick) ..	4	22,000	Workshops (brick) .....	2	4,000
Stores and dwellings (frame) ..	1	2,500	Workshop (frame) .....	1	500
Office buildings (brick) .....	11	1,047,367	Warehouses .....	7	53,950
Banks .....	1	65,000	Wheelwright shop .....	1	2,000
Store and assembly hall .....	1	45,000	Range .....	1	1,000
Store and apartment .....	3	52,000	Ovens .....	3	874
Store and office .....	3	33,659	Greenhouses .....	2	740
Stores .....	17	196,350	Observation stands .....	2	200
Assembly hall .....	1	10,000	Sheds (brick) .....	7	4,185
Gymnasium .....	1	6,500	Sheds (frame) .....	525	26,317
Elevators and electric motors ..	89	271,415	Minor repairs .....	3,251	32,251
Engines, boilers, etc. ....	66	140,846	Awnings .....	130	9,750
Gasoline tank .....	1	40	Fire escapes .....	46	9,200
Seminary .....	1	40,000			
Colleges or schools .....	4	875,000	Total .....	6,841	11,584,608
Hotel .....	1	7,000			

## Comparative statement for years 1902-3.

	New buildings.	Repairs.	Dwell-ings.	Apart-ments.
1903 .....	1,384	1,968	1,110	40
1902 .....	1,111	2,063	893	54
Increase .....	273	a 96	217	a 14

a Decrease.

## Valuation of building operations:

1903 .....	\$11,584,608
1902 .....	8,310,240
Increase .....	3,274,368

## Number of permits issued, including buildings, repairs and minor repairs, awnings, engines and and boilers, etc.:

1903 .....	6,408
1902 .....	5,727
Increase .....	681

Projections applied for .....	550
Inspections made, applications approved but not called for .....	127
Inspections made, applications not approved .....	142

The following summary will show the distribution of improvements in the different sections of the District and the value of the same:

	Buildings.	Repairs.
Northwest .....	\$5,304,932	\$1,465,613
County .....	3,452,781	135,964
Northeast .....	598,061	32,881
Southeast .....	296,275	61,609
Southwest .....	114,000	41,276
Total .....	9,796,069	1,737,333

Receipts of the office for the past year are as follows:

For building permits and repairs.....	\$3,575
For projections.....	526
For engines, boilers, ovens, gasoline tanks, elevators, electric motors, etc.....	126
For awnings.....	120
For stands.....	2
Total.....	5,089
Received for 1902.....	4,373
Increase.....	716

An examination of the foregoing summary affords a good example of the rapidly increasing business of this office, showing an increase in valuation of building operations of \$3,274,363 over the previous year. The building operations have increased steadily at the rate of over half a million dollars a year since 1894, when they were at their lowest ebb during the last twenty years, the valuation being at that time \$4,304,941. This steady increase in the volume of business has been transacted by this office with very slight increase in force employed over former times.

#### FIELD INSPECTORS AND PERMIT DIVISION.

At the present time we have nine men for general inspection. One of them is assigned to investigation of complaints, house numbering, and minor duties, leaving eight men for inspection of buildings in course of erection or repair, etc. Provision is also made for several additional inspectors to be appointed in the coming spring when building operations are at their height. I trust that an appropriation can be obtained to continue the services of the temporary assistant inspectors after July 1, 1904, as building operations continue unabated until September or October and the field force would be crippled in the middle of the building season by the withdrawal of these inspectors, and I earnestly recommend the continuance of the appropriation for temporary additional inspectors. The field force is still inadequate to frequently and thoroughly inspect 6,841 buildings and repairs during the year, being 855 constructions under the care of each inspector annually, but I must rest in my endeavors to increase this branch of the service in this office and to direct attention more especially to the permit division, which is still more overtaxed and decidedly behind the times for anything like a working force commensurate with the enormous amount of work in a modern city.

In this office the builder is supposed to be started right, and the permit clerk has many conditions and regulations to carry in mind. A mistake or oversight in accepting a faulty plan, or neglect to inscribe a necessary condition on a permit, may cause serious trouble after the work is started. Having held the position of permit clerk for six years, I fully appreciate that the responsibility and strain are too great for one man, when it is remembered that he has to pass on and issue 6,408 permits a year, or on an average of 21 a day. This branch of the work is transacted through the principal assistant inspector, who, with the assistance of one of the inspectors, who can ill be spared from his proper duties in the field, is required to pass upon the various subjects enumerated in the foregoing summary with such promptness and dispatch that it is impossible to give to each the consideration it deserves.

The builders of the city complain of the time consumed in obtaining permits, but considering the number issued each day it will be seen that this delay is unavoidable with the present force. There is now issued one permit every eighteen minutes, and when we stop to consider that within this time plans and specifications must be examined to ascertain whether they are in accordance with the regulations, and careful examination made of plats and locations and comparison of projections beyond the building line with plans approved, and calculations made on strength of materials, it seems evident that this branch of the work of the office should be provided with an increased force, so that it may be handled as it is in other large cities, in a more systematic manner. In order to do this at least two assistants should be assigned to the permit desk in addition to the principal assistant, but as these can not be spared from the small force in the field we are compelled to continue in the present very unsatisfactory manner until additional employees are authorized.

#### ARCHITECTS, CONTRACTORS, AND BUILDERS SHOULD BE LICENSED.

I beg to invite attention to reference in report of assistants to the present license law relating to contractors and builders, and heartily commend the suggestion that those who are licensed should be subjected to an examination by a competent board under conditions similar to the plumbing board or the board of steam examiners. It seems hardly reasonable that the law appreciates the necessity of licensing and

examining a man who is charged with the installation of plumbing fixtures in a house and the operation of a power plant, while the man who is responsible for the safety of the entire structure from foundations to roof, containing the plumbing fixtures and heating apparatus, is not required to furnish evidence of his ability to safely construct the building wherein the lives of hundreds may be jeopardized through his ignorance; and architects should also be examined and licensed.

#### ADDITIONAL ASSISTANT FOR HEATING APPARATUS AND EXAMINATION OF ELEVATOR OPERATORS.

The report of the assistant inspectors for elevators and fire escapes shows that they should be relieved of all duties not placed under their care by the title of their office and the intent of the law. They might properly inspect all elevators in the District at least once in three months, provided their time was not encroached upon for miscellaneous duties, such as inspection of heating apparatus, installation of gasoline tanks, and locating of power boilers, etc. I would also invite your attention to the suggestion that operators of elevators should be examined as to their qualifications, and most heartily concur in their recommendation that a board of examiners be appointed to pass upon the fitness of operators and issue licenses or certificates to proper persons under regulations approved by the Commissioners.

I would here suggest, in order to limit these inspectors to their legitimate and very responsible duties, that a new assistant be provided whose duties shall be the inspection of heating apparatus, location of gasoline tanks and boilers, frequent and between-time inspection of hotels, theaters, and buildings of like character, and all the miscellaneous work now imposed on the elevator inspectors. The labors of these inspectors would be alleviated and their inspections expedited by the appointment of an examining board for elevator operators. At present there are many owners or tenants who seem utterly ignorant or careless of the dangers attending an improperly kept and operated elevator and who actually obstruct the inspectors in the performance of their very responsible and necessary duties. Competent operators would assist in keeping the office informed and would save the owners much outlay for repairs and liabilities for damages for neglect of regulations. While the present regulations provide for prosecution for failure to comply with their terms, the loss of time consumed in such cases is a severe penalty on the inspector.

Several fatal accidents have resulted in the past year from the operation or management of elevators, not from mechanical defect, and I especially recommend the adoption of the suggestion that operators be examined as to their qualifications. The operator of an automobile is required to pass an examination, but the elevator operator seems to be selected according to the terms made with the owner, and in most of the accidents reported no regular or competent operator was present.

#### FIRE-ESCAPE LAW.

Reference is made to the defects of the present fire-escape law which has been depended upon for requiring means of saving life in case of fire or panic and has been applied in as practical a way as possible. All buildings mentioned in the act and requiring licenses have been inspected annually, and pending the approval of application for license have been in technical compliance with the law, though never, in most cases, effectually provided with proper safety appliances. I have recommended that another assistant inspector be appointed to relieve the inspectors of elevators and fire escapes of all miscellaneous work not strictly in their line of duty, and to be continuously employed to make frequent inspections to require proper maintenance of appliances after they are installed according to law.

#### SAFETY APPLIANCES.

Last year the Commissioners appointed a committee, consisting of the chief engineer of the fire department, assistant attorney for the District, inspector of buildings, and assistant inspector of buildings, to investigate and report on safety appliances in hotels, apartment houses, and buildings of a similar character. Your committee had frequent meetings, and after careful perusal of the present law and regulations upon the subject of fire escapes and other appliances concluded to apply the precautions as thoroughly as possible to all buildings which, in their opinion, came within the meaning of the law, and by that means to ascertain the applicability and insufficiency of the law. As nearly as possible inspections and notices were made concurrently by the fire department and this office, but gradually the shortcomings and ambiguity of the law were made apparent by diversity of opinion regarding its application and

efficacy, the committee differing widely on the question of character of buildings requiring red lights, gongs and manner of installing same, and necessity for fire escapes on fireproof buildings.

It was finally agreed that the chief of the fire department and the inspector of buildings should draw up a list of suggested changes and submit same to the assistant counsel for the draft of a new bill or regulation; and it was further agreed that the committee recommend the repeal of the present law and substitute a joint resolution of Congress conferring special authority on the commissioners to make regulations governing the application and maintenance of safety appliances in all buildings needing means of safety in case of fire or panic. In pursuance of such suggestion of the committee I beg to invite attention to the defects in present law or regulation, as given in report of inspectors of elevators and fire escapes, and recommend that same be referred to assistant counsel, with such suggestions as the chief of the fire department may make, to be embodied in a draft of new law on this subject.

#### DERRICKS AND SCAFFOLDS.

I beg again to refer to the frequency of accidents in the use of derricks, scaffolds, and lack of precautions for safety of workmen on buildings. The present regulations are silent on this subject, and the accidents of the past year, resulting fatally in several cases, seem to demand our care; but with our present force it would be a self-imposed obligation and responsibility entirely beyond our power to control. It therefore appears urgent to request that an inspector, experienced in the use and construction of hoisting machinery and scaffolds, be added to the office force.

#### COMPUTERS AND DRAFTSMAN.

I am thankful to report that one additional computer has entered upon his duties, thereby relieving the heretofore sole incumbent of a part of his onerous labors, which required many hours and nights of extra work to check the numerous plans passed through this office, and many other responsible duties that of necessity had to be performed after office hours. I would recommend, in order to properly compensate for such particular work, requiring men of ample experience and broad knowledge of technical subjects, that the salary of the senior computer in service be raised to \$1,800.

I would also recommend that my office be provided with a permanently employed draftsman to perform the numerous duties heretofore done by the principal assistant, the computer, and myself, in revising and making plans and specifications of buildings for the District government. Such buildings sometimes number as high as twenty-five in one year, and the preparation of so many plans and specifications in a private office would necessitate the employment of at least six draftsmen, and can not be performed by the present employees within office hours; besides, there are numerous plats and estimates to be prepared for this and other departments of the District government, which can only be done expeditiously by a draftsman assured of permanent employment. Some idea of the necessity for more help in this line can be gained by comparison with the Supervising Architect's Office of the Treasury. My last report covered twenty-nine buildings erected under the supervision of this office with but one draftsman and such incidental assistance as the other busy employees might afford.

#### REMOVAL OF DANGEROUS BUILDINGS.

One of the most trying and responsible duties imposed on the inspector of buildings is the removal of dangerous buildings or parts thereof. The danger from collapse of old, dilapidated, or damaged buildings seems to have been fully realized when the act of Congress approved March 1, 1899, was approved, and the law has been applied in many cases where the owner of the property can be subjected to service of required notice. But there are many cases now giving this office serious concern where old buildings are on the verge of collapse, but the law is ineffectual as long as the owner can not be served with a notice or arrested.

This law provides upon the neglect, refusal, or absence of the owner or responsible parties, that the inspector of buildings shall enter upon the premises with such workmen and assistance as may be necessary and cause the unsafe structure to be shored up, taken down, or secured, etc., and that the cost be assessed against the property and bear interest and be collected as taxes, etc. But the fundamental defect in the execution of the law is that it provides no funds from which to pay "workmen and assistants," and men who live by such work can not afford to wait several years until the amount is collected on assessment and paid to them.

I would therefore recommend that the small revenues of this office, amounting to about \$5,000 yearly, be intrusted to the auditor, or otherwise made available, as a means of executing the provisions of the law referring to dangerous buildings, and for temporary employment in emergencies of extra assistants, necessary to enforce the building regulations in the interest of public safety.

A portion of the above-mentioned amount should be made available for the purchase of implements for testing material, also for the purchase of a suitable wagon for transporting such implements and surveying instruments, used in leveling sites and laying out buildings. The carriage now in use is not suitable for conveying any heavy load or building materials desired at this or other buildings for test and is not arranged for safe transportation of delicate instruments. We are very much in need of a wagon with a flat bottom body and heavy springs, similar to a plumber's or painter's wagon, but light enough for inspection work by the inspector of buildings.

#### AMENDMENTS TO BUILDING REGULATIONS.

A few amendments have already been made to the regulations, but it is a continued complaint of builders and architects that frequent changes made from time to time without special notice keep them in a state of uncertainty, sometimes embarrassing them in the transaction of business with the owner, and requiring incessant application to this office for information not obtainable in the printed copies of the regulations in their possession.

I would therefore most earnestly request that printed copies of changes be sent to this office by the secretary of the Board of Commissioners for distribution, and would most respectfully recommend that certain dates be designated for changes, if possible, such as July 1 and January 1 of each year, and that all changes be advertised and distributed as near these dates as possible.

#### OFFICE FORCE.

The men in the office have worked earnestly and conscientiously with realization of the responsibilities placed upon them, and the clerical force give their services after the usual office hours in order to keep up the clerical work from day to day, and notwithstanding these efforts the work of the office is slightly behind with little prospect of completion before the winter months, when the building business is partially suspended. The clerical services required are of such a nature that I deem it but justice to recommend in the estimates for the fiscal year 1905 that their salaries be appropriately adjusted, and commend them for your consideration.

#### BUILDINGS COMPLETED.

The following buildings were completed during the present year:

Armstrong Manual Training School (boiler plant).  
Cells of new workhouse.  
Congress Heights engine house.  
McKinley Manual Training School (work not in former contract).  
Providence Hospital (work under former appropriation).  
Morgue wharf.  
Girls cottage, Industrial Home School.  
Deadhouse, Washington Asylum.

#### OTHER BUILDINGS AND WORK REPORTED.

The other buildings are in the following stages of construction or preparation:  
Edmonds School, Ninth and D streets NE. (8 rooms), 97 per cent completed.  
Simmons School, Pierce street (8 rooms), 85 per cent completed.  
Wheatley School, Twelfth and N streets NE. (8 rooms), 78 per cent completed.  
Montgomery School, Twenty-seventh street, near K NW. (8 rooms), 74 per cent completed.  
Ludlow School, Sixth and G streets NE. (8 rooms), contract made.  
N. P. Gage School, Le Droit avenue (8 rooms), ready for proposals.  
Brookland School, Wallace and Lansing streets (increased to 8 rooms), 70 per cent completed.  
Takoma School, Takoma (increased to 8 rooms), award of contract recommended.  
Reconstructing Cranch School, Twelfth and G streets SE. (8 rooms), 80 per cent completed.  
Stanton School, Good Hope (4 rooms), 91½ per cent completed.  
Reno School, Howard and Emory streets (4 rooms), 73 per cent completed.

Manual Training School, Seventh and G streets SE. (contract made).  
 Brookland School, site not determined (4 rooms).  
 Business High School, competitive plans submitted August 1, 1903.  
 Substation for police, Tenleytown, 90 per cent completed.  
 No. 5 police station, Fifth and E streets SE., 4 per cent completed. (Proposals opened on May 20, 1903, exceeded the amount available, and new plans prepared).  
 Truck house, fire department, Eighth street SE., excavating for foundations.  
 Engine house No. 14, Eighth street NW., plans approved for raising the roof.  
 Engine house, southwest, title to ground not obtained. Plans and specifications ready for proposals.  
 Morgue, revised plans completed and specifications being prepared.  
 Quarantine station, Reservation No. 13, data received for preparation of plans.  
 Brick building for employees Girls Reform School, necessary information for preparation of plans requested.  
 Reconstruction of cells, Old Workhouse, proposals to open August 27, 1903.  
 Rebuilding cells police court, proposals to open August 27, 1903.  
 Boiler plant, workhouse, plans being prepared.

#### DESCRIPTION AND CUBIC COST OF MUNICIPAL BUILDINGS.

The general description and cost per cubic foot of the buildings for the municipal government, constructed under the supervision of this office, is given in this report to assist in the preparation of estimates to show the increase of cost since 1897, when they were erected at 7 cents per cubic foot, while at the present time they cost about 12 cents a cubic foot, or 80 per cent more than formerly. This increase is accounted for by the advance in building material, increased cost of labor, use of more expensive plumbing and heating systems, and more ornate architectural treatment of exteriors, since the plans have been made by the architects of the city.

#### DAILY REPORT FORM.

During the present year a new system of daily reports from inspectors has been introduced, showing date, time, duration and stages of work on each building inspected, and record of condemnation. These reports are filed with the permit for the buildings to which they refer and make a permanent record of the transactions on each building. Similar reports are made by the elevator inspectors, giving valuable data as to size, material of cables and sheaves, and speed and capacity of car. It is hoped in this way to obtain practical information after a year's inspection to guide in formulating proper regulations and determining the average life of ropes under varying conditions. The only prospect of disappointment in this line of investigation lies in the neglect of machinist or elevator companies to notify the office when repairs are made and even in some cases the repairs are made by inexperienced persons who do not notify the office. It is expected that proper examination and control of operators would defeat such loose and dangerous practices.

#### TRANSFER OF ACCOUNTS.

In the spring of 1897 the inspector of buildings was ordered to cease keeping accounts of expenditures on school buildings, etc., and to transfer all data on this subject to the bookkeeper or accountant of the engineer department. In order to avoid any possibility of a deficiency on appropriations by overcharge for superintendents or otherwise, I would respectfully request that said bookkeeper notify this office when any appropriation balance approaches \$100.

#### HOUSE NUMBERING.

I would invite attention to the difficulty under present conditions of assigning more than temporary house numbers to buildings outside of Florida avenue in subdivisions where the streets do not conform to either the prolongation of city streets or the highway extension plans, and I would recommend the approval of some regulation as follows:

"After the streets are numbered and lettered and when the approved and adopted highway extension plans show the street upon which it is proposed to number the buildings, as a direct or nearly straight prolongation or extension of one of the streets of the city, the inspector of buildings shall apply, as far as practicable, the system of numbers provided for the city. And on streets or proposed streets not parallel to the cardinal streets regulating the house numbers, the method shall be as for numbering houses on avenues in the city. When a street or avenue makes an angle of less than 45° with East Capitol street, or extension thereof, the buildings shall be numbered as on the streets running east and west. When a street or avenue makes an angle of 45° or less with North Capitol, or extension thereof, the buildings thereon will be numbered as on streets running north and south. The buildings on curved streets and streets which change their direction to such a degree as to require

the numbering on a part of such streets from north to south and on another part from east to west, shall not be numbered by the general system but shall be numbered independently, beginning at the nearest point on such street to the Capitol and running to the end of the road or street, keeping the odd numbers on one side of the street and even numbers on the other side of the street."

I have the honor to append the reports of the principal assistant, the computer, assistant inspectors, and the assistant inspectors for elevators and fire escapes.

Very respectfully,

SNOWDEN ASHFORD,  
*Inspector of Buildings.*

Maj. JOHN BIDDLE,  
*Corps of Engineers, U. S. Army,  
Engineer Commissioner District of Columbia.  
(Through Capt. Chester Harding.)*

*Statement showing in detail the number of persons other than day laborers who were employed on regular and continuous work for thirty days or more during the fiscal year ended June 30, 1903, under authority of and paid from general appropriations.*

Superintendents of construction—Schoolhouses, workhouse, engine house, police stations, morgue wharf:

Five superintendents .....	\$4.00
Nine superintendents .....	3.50
Three draftsmen .....	3.00

I certify that the above-mentioned employees rendered service as superintendents and draftsmen, respectively, in supervising and preparing plans for the District buildings aforesaid, and were paid from the several appropriations for work on which they were employed.

Very respectfully,

SNOWDEN ASHFORD,  
*Inspector of Buildings.*

WASHINGTON, D. C., August 20, 1903.

SIR: I have the honor to submit herewith a report covering the construction work carried on by this department during the last year.

Nine contracts have been completed and accepted during the year, and we have now under contract 11 buildings, with plans and specifications and, in some instances, bids in hand for 13 other structures, which practically covers all appropriations available for this department.

While exercising my duties in the capacity of principal superintendent of construction I made numerous observations on the several styles of construction used in the school buildings, and as a result I can make no stronger argument as to what the general treatment should be than to indorse thoroughly the very interesting excerpt from the report of the schoolhouse department of Boston, which says:

"The new schoolhouses about to be erected should be plain, substantial structures, built in the most substantial manner, devoid of unnecessary or extravagant ornamentation, but attractive and tasteful from an architectural standpoint. The exterior walls to be in general of plain red brick, with a reasonable amount of granite or sandstone trimmings, and the interior fittings such as will meet the requirements of durability and fitness for the several purposes for which they are intended without being unnecessarily expensive."

In connection with the above paragraph I take the liberty of suggesting that the following memorandum be furnished architects commissioned with District work:

**Rooms.**—Class rooms should be from 24 to 26 feet wide and from 32 to 34 feet long. Cloakrooms adjoining and approximating 5 feet wide. Office, library, teacher's room and teacher's lavatory should be provided. Ceilings from 12 to 14 feet high. In the four and eight room buildings, which are recommended for administrative purposes, the rooms should be grouped around a central unobstructed hall.

**Doors.**—Entrance doors should each be 2 feet 6 inches by 7 feet solid, recessed to protect from weather or be double hung; vestibule doors same size, of skeleton frame, covered with fabric, or light panel doors, double hung. Interior double doors throughout, each 2 feet 3 inches for classrooms and 1 foot 9 inches for cloakrooms; all with glass panels; no transoms. No doors between classrooms and cloakrooms.

**Windows** arranged for rear and left hand lighting, with the greater number on the left side. They will contain not less than one-fifth of floor area.

**Floors** will be of Georgia pine rift or maple.

**Walls** finished in cream sand plaster floated up.

**Ceilings** to have hard white finish plaster.

*Blackboards* will be silicate, chalk shelf 2 feet 6 inches from floor and top mold forming shelf for models, photographs, etc., will be 6 feet 6 inches from floor.

*Kindergarten* should be provided with maroon burlap on walls in lieu of silicate, and on floor regulation circles and lines for kindergarten games should be painted in parti colors.

*Finish* to be in chestnut hard oiled or No. 2 white pine painted for interior work; exterior doors No. 1 white pine painted.

*Book closets* should be in each cloakroom, capable of containing 200 octavo volumes, and have provision for teacher's wraps.

*Staircases*.—Two stairways of fireproof construction, each 5 feet wide, treads 11 inches and risers 6½ or 7 inches. Treads 1½ inches slate with iron risers or solid stone steps.

*Vestibules* of terrazzo or tile.

*Hardware* should be antique copper, sand-blast finish.

*Basement*.—Playrooms to have wood floors. Lavatories to have concrete floor, also provide boiler, fuel, ash, bicycle and janitor's rooms.

*Toilets*.—Boys should have 10-stall standard slate urinals. Eight water-closets, 3 of which to be juvenile size. Wash sink. Girls to have 12 water-closets, 4 of them juvenile size. Teachers' toilet also in basement.

*Drinking fountains* in separate rooms from lavatories; also one in corridor on each floor of building.

*Gas*.—Six outlets in each class room and 4 in play rooms. All other rooms to have 1 outlet; 2 burners to each outlet.

*Heating* should be by steam or warm air under the plenum system, of such capacity as to maintain a temperature of 72° in severest weather. Heat introduced 8 feet above floor line through a register of area equal 1 square foot for each 10 pupils. Provide a gathering chamber in attic and return duct to heaters for circulating air overnight throughout the building.

*Ventilating* should be from registers at floor line, of such capacity as to provide each pupil with 30 cubic feet of fresh air per minute.

I would respectfully call your attention to the general conditions used in our specifications. These have been gone over very thoroughly, and are now used verbatim in all specifications. It would greatly decrease the cost of printing if these general conditions were printed in quantities and then attached to the several specifications.

I have taken up all contracts made by this department during the last six years, and herewith append a tabulated statement which shows the size and cost of the various buildings, together with other interesting data. The gradual increase in cost per cubic foot in the contracts, from an average of 7 cents to 12 cents, at the present time, is due almost wholly to the steady increase in the cost of building material and the higher wages paid to mechanics.

In concluding I wish to commend to your favorable attention the almost universal support and close study of the District's interests shown by the corps of superintendents of construction. I can not but feel that, through their intelligent handling of the various questions involved in construction work, a marked betterment is now being shown in the contracts.

The incidental and miscellaneous work requiring a certain amount of drafting is constantly and steadily increasing in the department. Then, too, we are called upon to prepare drawings for structures where the appropriations are limited to such an extent as to require the utmost economy and study in the arrangement of rooms, with simple and substantial constructional features.

In all such cases where the drawings were prepared in the office we have succeeded in obtaining proposals showing a very slight percentage of difference in bidding, and always within the amount available.

As it requires considerable time for a draftsman to become thoroughly familiar with our economic methods, I would respectfully urge upon you the desirability and almost necessity of having a draftsman who is thoroughly familiar with and competent to superintend constructional work, upon the permanent roll, to assist in the preparation of drawings and specifications and incidentally to look after the execution of the various items in connection with the construction work that are omitted from and usually done after the general contract is accepted.

I can not close this report without a reference to the uniform gentlemanly courtesy and helpfulness extended to me by the various assistant inspectors, and more especially the general knowledge of office practice gained through Mr. R. M. Evans, to whom I feel particularly grateful.

Appreciating most highly the confidence that you have personally and officially reposed in me, I remain,

Very respectfully,

A. M. POYNTON,

Principal Assistant Inspector of Buildings.

SNOWDEN ASHFORD,

Inspector of Buildings, District of Columbia.

# OPERATIONS OF THE ENGINEER DEPARTMENT, D. C. 87

*Descriptive schedule of buildings erected by the building department.*

Built.	Name and location.	Cost.	Cubical contents.	Cost per cubic foot.	Description.	Architect.
			<i>Feet.</i>	<i>Cents.</i>		
1897....	Payne School, Fifteenth and C streets SE.	\$21,266	308,382	6.9	8-room, red brick.	Inspector of buildings.
1897....	Langdon School, Langdon.	6,625	112,832	5.8	4-room, frame ....	Do.
1897....	Greenleaf School, Four-and-a-half, between M and N streets SW.	22,858	349,492	6.5	8-room, red brick.	Do.
1897....	Douglass School, First and Pierce streets NW.	24,921	349,492	7.1	.....do .....	Do.
1897....	Hayes School, Fifth and K streets NE.	27,831	351,840	7.9	.....do .....	Do.
1897....	Anthony Bowen School, Ninth and E streets SW.	25,202	315,560	7.6	.....do .....	Do.
1898....	Bruce School, Marshall street and Sherman avenue NW.	27,675	297,216	9.3	.....do .....	William M. Poindexter.
1898....	Engine House No. 14, Eighth street, between D and E, NW.	11,277	108,078	10.4	12-room, red brick.	F. B. Pyle.
1898....	Administration building, Industrial Home School.	29,000	312,840	9.2	30-room, red brick.	Inspector of buildings.
1898....	Hilton School, Sixth, between B and C streets NE.	27,999	294,408	9.6	8-room, red brick.	W. J. Marsh.
1898....	Engine House No. 15, Anacostia.	11,318	119,609	9.5	12-room, red brick.	Inspector of buildings.
1898....	Western High School, Thirty-fifth and T streets NW.	100,544	875,104	11.5	30-room, buff brick	Do.
1898....	Eckington School, First and Quincy streets NE.	27,278	353,722	7.7	8-room, red brick.	A. P. Clark, jr.
1898....	Toner School, Twenty-fourth and F streets NW.	27,753	267,455	10.2	.....do .....	Hornblower & Marshall.
1898....	Chevy Chase School, Connecticut avenue extended.	9,113	117,260	7.7	4-room, frame stucco.	Inspector of buildings.
1898....	Isolation building, Providence Hospital.	24,775	180,880	13.7	23-room, red brick	E. W. Donn, jr.
1899....	Nurses' Home, Washington Asylum.	5,725	68,160	8.4	19-room, frame....	Inspector of buildings.
1899....	Hubbard School, Kenyon, between Eleventh and Twelfth streets NW.	34,375	287,040	12.3	8-room, red brick.	Fuller & Garrett.
1899....	Alms house Wing, Washington Asylum.	13,885	86,151	13.9	12-room, red brick	Inspector of buildings.
1899....	Truck House E, Thirty-fourth and S streets NW.	16,509	106,440	15.4	10-room, red brick	L. E. Dessez.
1899....	Girls' Reform School, Conduit road.	45,836	298,656	15.3	79-room, red brick	J. G. Hill.
1900....	Dent School, South Carolina avenue and Second street SE.	36,442	326,294	11.2	8-room, red brick.	P. J. Pelz.
1900....	Chemical Engine No. 3, Tenleytown road.	16,892	106,752	15.8	8-room, buff brick	L. E. Dessez.
1900....	Webb School, Fifteenth and Rosedale streets NE.	35,392	296,000	11.9	8-room, red brick.	Glenn Brown.
1900....	Birney School, Anacostia.	36,585	295,750	12.0	.....do .....	C. L. Harding.
1900....	Truck house F, Whitney avenue, between Thirteenth and Fourteenth streets NW.	16,361	106,840	15.3	8-room dark-mottled brick.	L. E. Dessez.
1900....	Takoma School, Takoma Park.	21,276	169,475	12.5	4-room frame, stucco.	W. J. Palmer.
1901....	Lovejoy School, Twelfth and D streets NE.	34,693	308,850	11.2	8-room buff-mottled brick.	Robert Stead.
1901....	Police station No. 10, Whitney avenue, between Seventh and Eighth streets NW.	23,838	156,660	15.2	18-room red brick.	A. B. Mullett & Co.
1901....	Sayles J. Bowen School, Third and K streets SW.	37,787	285,300	13.2	8-room white-mottled brick.	Robert Stead.

*Descriptive schedule of buildings erected by the building department—Continued.*

Built.	Name and location.	Cost.	Cubical contents.	Cost per cubic foot.	Description.	Architect.
1901....	Thos. P. Morgan School, California avenue, near Eighteenth street NW.	36,446	318,240	<i>Cents.</i> 11.5	8-room common brick stucco.	W. B. Wood.
1901....	Benj. G. Orr School, Twining City.	22,777	202,300	11.3	4-room red brick...	Inspector of buildings.
1901....	William Syphax School, Half street, between N and O streets SW.	39,237	306,487	12.1	8-room red brick...	Marsh & Peter.
1901....	Chemical Engine No. 4, Brookland.	.....	60,480	.....	.....do.....	Inspector of buildings.
1901....	Kenilworth School, Kenilworth.	22,946	202,300	11.3	.....do.....	Do.
1901....	Receiving ward, Washington Asylum.	13,103	93,200	14.0	16-room frame, stucco.	M. W. Bayliss.
1901....	School building, Industrial Home School.	17,084	136,442	12.5	4-room red brick...	W. G. Peter.
1902....	Armstrong Manual Training School, P street, between First and Third NW.	131,120	630,100	20.7	28-room cream-mottled brick, fireproof.	W. B. Wood.
1902....	McKinley Manual Training School, Seventh street and Rhode Island avenue NW.	130,014	556,700	23.3	26-room buff-mottled brick, fireproof.	H. L. Cobb.
1902....	Petworth School, Petworth.	23,143	205,250	11.3	4-room red brick...	A. P. Clark, Jr.
1902....	Langston School, P street, between North Capitol and First NW.	36,855	383,200	9.6	8-room red brick...	Do.
1902....	Matthew G. Emery School, Lincoln avenue and Prospect street NE.	49,269	411,360	12.0	12-room white-mottled brick.	Inspector of buildings.
1903....	Addition to girls' cottage, Industrial Home School.	6,588	43,680	12.7	6-room red brick...	Do.
1903....	Chemical Engine No. 5, Congress Heights.	19,969	149,250	13.3	14-room red brick	Do.

WASHINGTON, D. C., July 1, 1903.

SIR: I have the honor to submit my annual report for the fiscal year ending June 30, 1903, as follows:

First. I have made 322 sets of computations for new and the alteration of old buildings during the year, this being 86 sets in excess of the previous year, each set containing from 1 to 30 sheets of computations.

Second. A large number of sets of drawings have been examined and passed upon by me without computation, the necessity for such computation not having existed.

Third. I have made 84 sets of computations for the overhead structural work of new elevators, 17 of which have been of the slow-speed class for the handling of freight, and 67 high-speed passenger elevators. Of the latter class a number of the more recently erected have machinery capable of developing a car speed of 500 feet per minute. The machinery has been intricate and complex, and the resultant stresses on the structural work, over which I have control, correspondingly great.

I have to report a very distinct improvement in this class of structural work during the year, and I desire to especially thank Mr. A. M. Lawson and Mr. W. I. Evans, the gentlemen in charge of the elevator machinery, for their hearty cooperation.

Fourth. I have had drilled, personally inspected, and calipered within the last six months 1,002 cast-iron columns, 16 of which I condemned as unfit for use, and ordered them removed from the place of inspection or destroyed. In 15 cases my orders were immediately complied with, but in the remaining case my order was not obeyed—I destroyed the casting.

Fifth. During the year I have examined, tested, and made strain sheets and computations of 18 dangerous roof trusses, 16 of which were condemned and removed, the remaining 2 being reinforced and strengthened.

Sixth. I have made strain sheets for many complex new roof and other trusses during the year. I have found generally a sufficiency of sectional area in material used, but quite frequently the connection details are sadly lacking, and I find too frequently a deficiency in the number of rivets and bolts, or a deficiency in the actual bearing surface of the material.

Seventh. I have conducted many most interesting foundation tests during the year. In several instances, owing to the peculiarity of the case, special appliances

had to be devised, and in every instance these appliances have proven successful. It is also a matter for congratulation that, although some of the tests have been prosecuted under extremely dangerous conditions, there has not been a single accident from this cause.

Eighth. I have required and directly conducted such tests of patent floor and sidewalk construction as the peculiarities of the individual case demanded and without accident.

The very great necessity for and the importance of such tests can not be overestimated, nor can the (in many cases extreme) danger to those directly conducting such tests be ignored.

Ninth. The necessity for settlement tests are infrequent; the few, however, that I have conducted during the year have required, from the very peculiar conditions prevailing, the utmost delicacy and nicety of manipulation, and have taken up much valuable time.

Tenth. There has been an undoubted improvement in the construction and equipment of the derricks, cranes, overhead travelers and other hoisting apparatus during the year. There being no regulations covering this most important point, I have had to use moral suasion and convincing argument to gain the ground I have, and am pleased to report a better type of construction, a better type of mechanical equipment, an incomparably better system, type, and quality of rigging, and a distinct advance in the quality of material used, in several instances having had wood and cast iron replaced by steel construction.

While thanking you for your esteemed cooperation, and your corps of assistants for their kindly consideration, the fact exists that it would have been quite impossible for any one man to have accomplished what I have done had I not voluntarily extended my hours far beyond the usual day.

At one time for eight consecutive weeks, during the latter part of the fiscal year, my days started at 7 a. m. and terminated at 11 p. m., with short intermissions for meals and while on the cars between this office and my home, practically doubling the official day. Professional pride, to keep the work of my office up to a fair standard of excellence, the interest of the public and, above all, the safety of the public, have been the causes that have led me in many instances to entirely sacrifice all personal interest and comfort, and as a result we have had neither accident nor calamity to mar the history of the year.

Very respectfully,

SNOWDEN ASHFORD,

*Inspector of Buildings, Washington, D. C.*

C. W. SOMMERVILLE,

*Computer, Building Department.*

WASHINGTON, D. C., July 12, 1903.

DEAR SIR: We have the honor to submit the following report of our official duties as assistant inspectors of buildings during the fiscal year ending June 30, 1903:

Visits to new buildings .....	23,577
Visits to old buildings .....	6,749
Visits of miscellaneous character .....	4,512
<b>Total, 1903 .....</b>	<b>34,838</b>
<b>Total, 1902 .....</b>	<b>33,787</b>
<b>Increase .....</b>	<b>1,051</b>
Condemnations of buildings or parts thereof .....	824
Condemnations of dilapidated buildings .....	51
Number of buildings renumbered .....	131

The increase in the number of inspections, as compared to the number made in the previous year, does not represent the actual increase in the amount of work performed by your assistants in the field. The amount and importance of the work performed will be better understood by a comparison of the character and cost of building for the fiscal year ended, as compared with that of the previous year. The records show an increase of about 34 per cent in cost.

During the year a number of large office, apartment, and other buildings of a private character have been erected. These buildings are larger in size and more modern in construction than those erected during any previous year.

A large per cent of the building operations for the year have been outside the city proper, in the county and in widely separated districts, involving an extra amount of travel on the part of your assistants.

The supervision and inspection of stands constructed for the review of the parade and ceremonies incident to the encampment of the G. A. R. in October, 1902, made it absolutely necessary to temporarily increase the field force by the transfer of sev-

eral of the superintendents of construction to assist in that work. It is gratifying to note that notwithstanding the thousands occupying the stands throughout the line of parade no accident occurred through faulty construction.

We would respectfully renew the suggestion made in our report for the fiscal year ending June 30, 1902, viz: There is a class of persons engaged in the building business as contractors and subcontractors whose lack of technical or practical knowledge of construction leads them to frequent violations of the regulations. In a business which so closely involves the safety of life and limb as well as the protection of property, it is but reasonable to presume that those who are engaged in business as general building contractors should have the knowledge essential for the safe and proper conduct of such business; and subcontractors, upon whose branches of the work the stability and safety of the entire superstructure is primarily dependent, should be required to exhibit a sufficient knowledge of their business to insure the public against dangerous or faulty construction. Inasmuch as the present law requires that contractors be licensed, we would respectfully suggest that before such license be granted applicants be required to pass an examination before a competent board of examiners to determine their qualifications as builders, and that they be required to register in this office.

Our experiences during the past year has confirmed the opinion that the adoption of such a measure would be beneficial not only to the building owner but also to the legitimate contractor.

Thanking you for your uniform kindness and consideration, we have the honor to remain,

Very respectfully,

R. M. EVANS,  
CHAS. A. HARKNESS,  
HENRY STOREY,  
THOMAS FRANCIS,  
JOHN P. HEALY,  
EDWARD KERN,  
PAUL E. VOLLUM,  
*Assistant Inspectors of Buildings.*

SNOWDEN ASHFORD,  
*Inspector of Buildings, Washington, D. C.*

WASHINGTON, D. C., July 3, 1903.

DEAR SIR: We have the honor to submit the following report of duties performed during the fiscal year ending June 30, 1903:

New elevators installed .....	86
Inspections of elevators .....	1,085
Condemnations on elevators .....	422
Inspections of elevators for United States Government .....	21
Condemnations on elevators for United States Government .....	13
Fire escapes erected .....	46
Fire escapes erected, compulsory .....	28
Inspections of fire escapes .....	214
Condemnations on fire escapes .....	56
Steam boilers installed (power purposes) .....	34
Steam engines installed (power purposes) .....	33
Steam engines installed (commercial purposes) .....	8
Heating boilers installed (remodeled buildings) .....	20
Gas engines installed .....	8
Gasoline engines installed .....	1
Gasoline storage tanks (commercial purposes) .....	2
Gasoline storage tanks (domestic purposes) .....	1
Inspections of buildings occupied as hotels .....	377
Condemnations of buildings occupied as hotels for lack of safety appliances ..	125
Bake ovens erected .....	3
Miscellaneous inspections .....	518
Miscellaneous condemnations .....	173
Electric motors (commercial purposes) .....	3
Total number of inspections made .....	2,733

In submitting the above we invite attention to the fact that there have been four accidents during the year, with no fatalities and but two persons injured. Of these accidents it may be said that none were caused by defective gearing or machinery, two having occurred on electric elevators, the electric current for which is taken from electric railway circuits that have a great variation of voltage, so much so at times that the voltage will not permit the elevators to travel at more than half their normal speed, and at other times causes them to exceed it. With this great fluctuation

tion of the electric voltage it is imperative that the elevator operator should be skilled in the management of the motor and car. The other accidents occurred on hydraulic elevators in hotels, in which two persons were injured, one by his own carelessness and the other partly through an error of judgment on the part of one of the steam engineers of the plant, who was also injured, and partly through the carelessness of the operator of the elevator.

It is safe to say that if the operators handling these elevators at the time of accident had been thoroughly conversant with the operation, and alive to the responsibilities attending, these accidents would not have occurred.

We can not too strongly urge upon you the necessity for the creation of a board of examiners to inquire into the ability of persons operating elevators in the District of Columbia. Said board should consist of at least three persons, and to be formed on the lines of the board recently appointed by the Commissioners for the operation of locomobiles and automobiles in the District.

The great advance made in the standard of construction and the erection of elevators, and the greatly increased number of installations during the past year have very materially increased the already great responsibilities and labors of your inspectors, but with the able assistance of Mr. C. W. Sommerville, computer for your department, in determining the strength and capacities of rails, beams, etc., we have been able to keep pace with the exigencies.

We would also call your attention to the failure of steam-heating contractors to obtain permits from this office before installing heating apparatus in buildings in many instances. The regulations, though thoroughly acquainted with, are ignored, and consequently the owners of property are made to suffer thereby. This, we believe, is a hardship upon persons who are neither familiar with the technicalities of heating or the regulations governing the same, therefore we would respectfully suggest an amendment to the regulations which will place the heating contractors in the same category with those who conduct the plumbing business, i. e., "That no person shall be permitted to install any steam or hot-water boiler, furnace, or hot-blast system of heating in any building now erected or hereafter erected, unless said person shall have been duly and regularly registered in the office of the inspector of buildings, District of Columbia, for the purpose of conducting the business of heating and ventilating of buildings, and that no person shall be permitted to register in the said office unless said persons have proven their ability, to the entire satisfaction of the inspector of buildings, to conduct the business of heating and ventilating in a safe and workmanlike manner, for the protection of health of persons and the safety of property from fire or explosion." In this event the heating contractors would be directly responsible to this office for their actions, and when they neglected or refused to take out permits, as required, this office would be in a position to deal with the situation as occasion demanded.

To impress the importance of a regulation of the above character, we respectfully state that in our endeavors to faithfully execute the intent of the building regulations now in force and protect the uninitiated from the unscrupulous contractor, we swore out warrants against such contractors for failure to comply with the said regulations. The case was dismissed, the trial judge saying that "the owner was the responsible party, and not the contractor," and this in the face of our desire to protect the owner. Thus you will observe that this office can not now give the protection so essential to persons and property.

The act of Congress approved June 24, 1887, and March 2, 1895, entitled "An act for the further protection of property from fire, and safety of lives, in the District of Columbia" is not adequate for present exigencies. We therefore strongly urge upon you the necessity of seeing to it that this law may be so amended as to require fire escapes on all buildings three stories or more in height and not of fireproof construction, used as hotels, factories, manufactories, theaters, tenement houses, seminaries, colleges, academies, hospitals, asylums, halls or places of amusement, buildings occupied as office buildings, department stores, or other buildings where large numbers of persons congregate or assemble.

This law does not give the inspectors of fire escapes authority to order removal of obstructions from fire escapes after the escapes are in place and the buildings are occupied. There have been many cases where obstructions, such as ice boxes, refrigerators, garbage cans, ash boxes, etc., have been placed on the balconies in such a manner as to entirely block the way to the ladders.

If obstructing fire escapes were made a misdemeanor and punishable by fine, it would in a great measure tend to facilitate the labors of your assistants and save many unpleasant visits to the occupants of such buildings.

The act requires that buildings occupied for the purposes above enumerated, excepting office buildings and department stores, must be 50 feet or upward in height before fire escapes can be authoritatively required. Escapes can not now be required on buildings occupied as office buildings and department stores, no matter what the

construction or height, unless there be a factory or manufactory conducted in some portion thereof.

There have been many buildings recently erected in the District of Columbia of inflammable material which have very meager means of exit and are occupied as apartment houses and hotels, which are within a few inches less than the 50 feet prescribed in the act, and in several cases have a much larger number of occupants than buildings of greater height and equipped with fire escapes. The former class of buildings in some instances have but one stairway each, constructed of very inflammable material, as a means of exit for those who may be caught in the upper stories in times of fire.

This law is also very indefinite as to whether the alarms or gongs shall be operated by hand or electricity, or whether they are operated singly or collectively, or whether or not operating stations should be conveniently located so that any occupant may set all the alarms in operation at one time in case of necessity without having to run a great distance through hallways, down or up several flights of stairs, before a station can be reached.

The notices provided for in the above act are not of a uniform character. Some proprietors print the notices in very small type, placing them at the bottom of advertising cards and posting them in the sleeping rooms, thus technically complying with the law; while others merely say "The fire escapes are located at the end of hallways," etc.

The proprietors of establishments where persons are temporarily housed should be required to make plans of each floor showing the location of all fire escapes and other means of exit, and indicating the course to same; and also have the hallways placarded with signs showing the direction to the nearest escape; and where escapes are reached through rooms that may be locked, signs should be placed projecting into the hallways at the doors with the words, "To the fire escape." If it is not possible to have the doors removed from their hinges, where such obstructions are made, portable fire escapes should be required for rooms remote from the location of the standard escapes.

Among other things this act provides "That hallways and stairways shall be properly lighted when occupied at night; and at the head and foot of each flight of stairs, and at the intersection of all hallways with main corridors shall be kept during the night a red light;" and the regulations governing "theaters and other places of public assembly," section 176, requires that red lights over exits in the auditorium and all lights in passages and stairways shall be independent of the lights in other parts of the house and so arranged that they can not be turned off from the stage or platform."

It will be seen by the above that a conflicting idea is created in the minds of the theater-going public who happen to live in a hotel or apartment house, the exit lights in theaters teaching them that red lights mark all exits and in time of panic in their homes are as liable to cause them to rush from a fire escape as to it. In many cases the hallways, corridors, and stairways are so located as not to be in touch with any fire escapes or exits, and makes it difficult to understand the red-light mark.

A uniform system of marking exits should be adopted for all places of public assembly and in hotels. The marking of exits in apartment houses is of but little assistance, because of the permanent character of the occupancy, and the rules of this office now in force is to touch each suite of rooms with escapes.

Thanking you for your kind consideration and support during the past year,

Very respectfully,

A. M. LAWSON,

W. I. EVANS,

*Inspectors of Elevators and Fire Escapes.*

SNOWDEN ASHFORD,

*Inspector Buildings, Washington, D. C.*

#### REPORT OF THE SUPERINTENDENT OF REPAIRS.

WASHINGTON, D. C., August 31, 1903.

SIR: I have the honor to submit herewith a report of the operations of the repair department for the fiscal year ending June 30, 1903.

Appropriations amounting to more than \$85,000 were expended for repairs to school buildings, engine houses, police stations, market houses, and police court. The greater portion of this work was done by day labor.

During the months of July, August, and September there were more than a hundred men employed in the prosecution of the repair work. This large force was only necessary when the schools were closed.

In order to show how the various appropriations were expended, I have set forth

# OPERATIONS OF THE ENGINEER DEPARTMENT, D. C. 93

as far as possible the amounts allowed each building, and in a general way described the character of the work completed.

Name of school.	Amount ex- pended.	Name of school.	Amount ex- pended.
<b>First division:</b>		<b>Seventh division—Continued.</b>	
Adams .....	\$350.54	Chevy Chase .....	\$63.16
Berret .....	192.15	Hamilton .....	115.91
Dennison .....	1,046.21	Langdon .....	89.63
Force .....	371.23	Monroe .....	271.72
Franklin .....	4,445.38	Takoma .....	450.74
Harrison .....	320.54	Tenley .....	568.74
Hubbard .....	440.44	Mott .....	289.75
Johnson .....	283.68	Woodburn .....	218.63
Johnson Annex .....	218.18	Brightwood (colored) .....	49.58
Phelps .....	725.45	Bruce .....	227.14
Thompson .....	214.18	Wilson .....	441.87
Morgan .....	58.06	Bunker Hill .....	36.66
		Grant Road .....	76.38
<b>Total .....</b>	<b>8,662.04</b>	Ivy City .....	192.43
<b>Second division:</b>		Petworth .....	49.67
Abbot .....	344.46	Chain Bridge .....	66.31
Eckington .....	249.37		
Henry .....	386.13	<b>Total .....</b>	<b>3,588.13</b>
Morse .....	305.90	<b>Eighth division:</b>	
Polk .....	202.91	Buchanan .....	221.94
Seaton .....	613.91	Cranch .....	134.28
Twining .....	663.14	Tyler .....	474.64
Webster .....	255.30	Bennings (white) .....	86.16
Emery .....	94.22	Congress Heights .....	105.58
		Good Hope .....	65.48
<b>Total .....</b>	<b>3,115.34</b>	Van Buren .....	269.83
<b>Third division:</b>		Van Buren Annex .....	190.76
Brent .....	360.46	Benjamin Orr .....	442.01
Carbery .....	726.51	Bennings Road .....	165.43
Dent .....	294.65	Birney .....	220.85
Hilton .....	606.13	Burrville .....	205.55
Lenox .....	354.26	Garfield .....	192.45
Maury .....	345.95	Hillsdale .....	216.88
Peabody .....	476.48	Kenilworth .....	10.50
Towers .....	548.02		
Wallach .....	1,415.49	<b>Total .....</b>	<b>3,081.78</b>
<b>Total .....</b>	<b>5,127.90</b>	<b>Ninth division:</b>	
<b>Fourth division:</b>		Briggs .....	137.54
Amidon .....	288.47	Garrison .....	427.24
Arthur .....	478.59	Magruder .....	657.84
Bradley .....	685.97	Phillips .....	181.49
Greenleaf .....	182.01	Stevens .....	183.69
Jefferson .....	1,700.19	Sumner .....	416.46
Potomac .....	75.54	Wormley .....	228.58
Smallwood .....	361.61	Minor .....	19.28
S. J. Bowen .....	78.15		
McCormick .....	214.72	<b>Total .....</b>	<b>2,252.07</b>
<b>Total .....</b>	<b>4,065.25</b>	<b>Tenth division:</b>	
<b>Fifth division:</b>		Banneker .....	178.88
Addison .....	292.46	Douglas .....	399.18
Conduit road .....	33.12	Garnett .....	400.45
Corcoran .....	300.75	Cook .....	689.57
Curtis .....	324.39	Jones .....	372.85
Fillmore .....	251.04	Logan .....	698.37
Grant .....	1,982.80	Patterson .....	279.47
High Street .....	59.48	Slater .....	524.17
Jackson .....	772.61	Langston .....	94.44
Reservoir .....	151.12		
Threlkeld .....	78.88	<b>Total .....</b>	<b>3,637.33</b>
Toner .....	192.92	<b>Eleventh division:</b>	
Weightman .....	200.54	Ambush .....	813.49
		A. Bowen .....	264.61
<b>Total .....</b>	<b>4,640.11</b>	Bell .....	469.22
<b>Sixth division:</b>		Giddings .....	337.09
Blair .....	210.51	Lincoln .....	903.46
Blake .....	809.87	Lovejoy .....	151.55
Gales .....	258.78	Payne .....	618.45
Hayes .....	514.43	Randall .....	192.96
Madison .....	280.55	Syphax .....	108.78
Pierce .....	393.54		
Taylor .....	576.58	<b>Total .....</b>	<b>3,859.60</b>
Webb .....	300.17	Central High .....	1,676.02
<b>Total .....</b>	<b>3,394.43</b>	Western High .....	1,836.38
<b>Seventh division:</b>		Eastern High .....	667.73
Brightwood .....	155.09	Business High .....	353.58
Brookland .....	224.72	M Street High .....	1,062.91
		McKinley Manual Training .....	24.50
		Armstrong Manual Training .....	268.28

## SUMMARY.

Repairs accounted for .....	\$51,115.12
Office salaries .....	1,442.00
Horses and driver .....	1,379.74
Material purchased and on hand .....	1,087.38
Miscellaneous .....	25.76
Total .....	55,000.00

To give an idea of the character of the repairs made I have enumerated the largest items under the heads of carpentering, painting, and tinning, viz:

*Carpentering.*—New floors were laid in 17 buildings, viz, Dennison, Force, Seaton, Franklin, Phelps, Polk, Twining, Peabody, Towers, Bradley, Addison, Curtis, Taylor, Garrison, Slater, Lincoln, Central High.

*Painting.*—The exterior of three schools were painted and penciled, and one painted, viz, Franklin, Jefferson, Wallach, Cook. The exterior wood and iron work was painted at the Arthur, Thompson, and Bradley. The entire interiors of the Jones and Carbery were reglained and varnished. The interiors of the Dennison and Harrison were revarnished.

More or less painting, graining, and varnishing was done in the Seaton, Gales, Dent, Towers, Central High, Henry, Adams, Johnson, Johnson Annex, Greenleaf, Twining, Eckington, Eastern High, Maury, Morse, Force, Phelps, Hubbard, Douglas, Colored High, Garrison, Buchanan, Congress Heights, Stevens, Van Buren, Van Buren Annex, and Monroe.

Blackboards in nearly every school were repaired and reslated where necessary. Repairs of some nature were made in every schoolhouse in the District.

*Tinning.*—A large amount of the work had to be renewed at a number of the school buildings. New valleys were put on the Twining, Dennison, Payne, Jackson, Carbery, and Blake. Of the work let out and completed under contract the most important was kalsomining, steam-fitting, and whitewashing.

*Plumbing.*—This department receives all requests for repairs and immediately orders same made. During the year more than 500 orders were given for plumbing work, the cost of which was \$2,640.

## REPAIRS TO ENGINE HOUSES, 1903.

Engine No. 1.....	\$402.50	Engine No. 15.....	\$271.50
Engine No. 2.....	210.38	Chemical No. 1.....	323.50
Engine No. 4.....	259.41	Chemical No. 2.....	97.75
Engine No. 5.....	427.15	Chemical No. 3.....	207.17
Engine No. 6.....	307.04	Chemical No. 4.....	4.25
Engine No. 7.....	186.73	Truck A.....	676.39
Engine No. 8.....	554.68	Truck B.....	610.75
Engine No. 9.....	366.70	Truck C.....	493.40
Engine No. 10.....	568.75	Truck D.....	166.04
Engine No. 11.....	366.26	Truck E.....	186.10
Engine No. 12.....	328.19	Truck F.....	153.03
Engine No. 14.....	325.38		

## SUMMARY.

Repairs accounted for .....	\$7,493.05
Office salaries .....	228.00
Material purchased and on hand .....	50.35
Miscellaneous .....	228.60
Total .....	8,000.00

The repairs and improvements called for in this department doubled the amount of the appropriation. This very naturally necessitated the omission of a great deal of work that should have been done. Owing to the installation of new apparatus at several of the engine houses which was not cared for in the estimates, a deficiency of several hundred dollars was created.

It was not known at the time the estimates were made up that the widening of the tracks was to be done. Congress at its last session made this deficiency good by voting \$500 to the department, which was made available immediately.

*Carpentering.*—New floors were laid and old ones repaired and new stalls built at the following houses: Engine houses Nos. 1, 5, 6, 7, 8, 9, 10, 11, 12, and 14, Chemical No. 1, trucks B and C.

*Painting.*—All exterior iron and wood work at No. 8 was painted, also part of ceiling and walls at No. 14.

# OPERATIONS OF THE ENGINEER DEPARTMENT, D. C. 95

**Tinning.**—New tin roofs were put on Nos. 10 and 12, and new valley on trucks B and C.

**Plumbing.**—New plumbing was installed at Nos. 1, 2, 4, 5, Truck Companies A, B, and D, also in engine houses Nos. 8, 12, and 14.

## REPAIRS TO POLICE STATIONS, 1903.

[Appropriation, \$5,000.]

Station No. 1.....	\$517.55	Station No. 7.....	\$465.70
Station No. 2.....	218.74	Station No. 8.....	834.17
Station No. 3.....	166.93	Station No. 9.....	776.59
Station No. 4.....	628.12	Station No. 10.....	245.29
Station No. 5.....	29.78	Substation .....	29.55
Station No. 6.....	455.41		

## SUMMARY.

Amount accounted for .....	\$4,667.83
Office salaries .....	114.00
Material purchased and on hand .....	32.90
Miscellaneous .....	185.27

Total ..... 5,000.00

The police stations are all in a good state of repair, the appropriation being about sufficient for the number of houses now in service. The work done in the department consisted of carpentering, tinning, plumbing, and steam fitting, viz:

**Carpentering.**—Floors were laid and renewed at stations Nos. 1, 4, 7, and 8.

**Painting.**—Station No. 1, windows, doors, and blinds; Station No. 8, all exterior painted and penciled; Station No. 9, interior painted.

**Tinning.**—Station No. 7, new tin roof put on.

**Plumbing.**—Stations Nos. 4 and 9, new plumbing installed.

## REPAIRING AND RENEWING HEATING AND VENTILATING APPARATUS; SCHOOLS, 1903.

[Appropriation, \$12,000.]

## SUMMARY.

Gas engines and fans .....	\$6,138
New furnaces in Woodburn, Chevy Chase, and Langdon schools.....	1,810
Repairs to heating apparatus .....	3,710
Office salaries .....	342

Total ..... 12,000

There were nine gas engines and fans installed for the better ventilation of the buildings in which they were placed. The installation of the engines and fans were in the following-named schools, viz: Morse, Twining, Brent, Maury, Amidon, Blair, Wormley, Banneker, and Cook.

In addition to the installation of engines and fans there were six furnaces installed, two in each of the following buildings, viz: Woodburn, Chevy Chase, and Langdon schools.

## REPAIRS TO MARKET HOUSES.

[Appropriation \$2,250.]

## SUMMARY.

Western market.....	\$1,195.75
Eastern market .....	666.68
Georgetown market .....	302.57
Office salaries .....	85.00

Total ..... 2,250.00

The Western and Eastern market houses are in a fair state of repair. The exterior of both were painted and in the Western market a new closet was installed, which adds greatly to the convenience of its patrons. At the Eastern market house the wainscoting back of the fish stalls was torn out and replaced by cement, making a much-needed improvement. The ceiling and gas pipes of the Georgetown market house was painted.

In addition to the repairs and improvements made under the above appropriations,



## PORTLAND CEMENTS.

The 6,794 samples of Portland cement represent 67,672 barrels, of which 10,446 were rejected.

*Portland cements.*

Brand.	Number of barrels.	Number of samples.	Per cent residue 100-mesh sieve.	Initial set.	Per cent water used.		Temperature of air and water.	Tensile strength.		
					Neat cement.	3 parts sand.		Neat cement.		7 days, 3 parts sand.
								1 day.	7 days.	
Alpha <sup>a</sup> .....		15	7.8	<i>h. m.</i>	18.7	8	74	394	739	323
Atlas.....	3,501	350	7	1 30	18	9	76	415	703	303
Krause.....	16,999	1,699	7	2	19	9	75	534	908	350
Lehigh.....	12,765	1,276	7	2	19	9	72	380	776	309
Martins Creek <sup>a</sup> .....		15	8.2	5 35	18	8	72	377	903	315
Nazareth.....	7,185	718	5	2	19	9	73	358	748	328
Old Dominion.....	14,072	1,407	6	1 20	20	9	75	444	738	313
Vulcanite.....	2,704	270	8	2	19	9	74	409	882	364
Total.....	57,226	5,750								

<sup>a</sup> Test samples.

## ASPHALT PAVEMENTS.

*Sheet asphalt.*—The contract for paving with sheet asphalt during the past fiscal year was awarded to the Barber Asphalt Paving Company. As this company had no asphalt on hand at the time of awarding of this contract that was not acted upon by water, it requested that the Commissioners allow it to lay Trinidad asphalt on a concrete base which had been made impervious to water by painting it with Bermudez asphalt dissolved in naphtha. This permission was granted, and all streets done in the fall and winter were constructed in this way. On beginning the work in the spring this company instituted the use of Bermudez asphalt, which passed the specifications satisfactorily.

*Asphalt block.*—The contract for paving with asphalt block in this city was awarded to the Washington Asphalt Block and Tile Company. This company imports and refines asphalt from the lake deposit at Trinidad. The asphalt paving cement used in its block during the past year has been made of Trinidad asphalt, fluxed with oxidized petroleum residuum, a product known on the market as byerlite. This flux was used in such quantities as to so reduce the quantity of Trinidad asphalt in the paving cement that it was much less acted on by water, and at the same time the quality of the cement was greatly improved for this character of pavement.

*Crude Trinidad asphalt.*—During the past year 7 samples were examined, which showed an average of 52.62 per cent bitumen soluble in carbon disulphide.

*Petroleum residuum.*—Under this heading are included all fluxes used for the softening of asphalts into paving cements. Of the 20 samples of fluxes examined, 18 have been for the Barber Asphalt Paving Company and 2 for the Cranford Paving Company. The Barber Asphalt Paving Company used a flux manufactured by the Standard Oil Company, it being a residue from Beaumont, Tex., petroleum oil. The two samples of oil submitted by the Cranford Paving Company were the same as those for the Barber Asphalt Paving Company.

*Asphalt cements.*—The results of the tests made on asphalt cements submitted by the various paving companies during the past year will be found in the following table:

Table showing penetrations of asphalt topping cement and binder during fiscal year ending June 30, 1903.

	Asphalt topping cement.				Asphalt binder cement.			
	Number of samples.	Penetration.			Number of samples.	Penetration.		
		High-est.	Low-est.	Aver-age.		High-est.	Low-est.	Aver-age.
Barber Asphalt Paving Co.:								
Bermudez .....	18	60	46	52	5	101	64	81
Trinidad .....	9	65	43	49	6	89	47	70
Brennan Construction Co. ....	4	54	46	49	2	85	53	54
Cranford Paving Co. ....	94	56	37	47	93	125	66	94

*Asphalt surface mixtures.*—During the year 137 samples were submitted by the three paving companies. The following tables show the maximum, minimum, and average per cent bitumen found, and the average mesh composition of sands used in the paving mixtures:

	Barber Asphalt Paving Co.	Brennan Construc- tion Co.	Cranked Paving Co.
Number of samples.....	31	4	102
Average per cent bitumen.....	10.40	11.09	10.25
Lowest per cent bitumen.....	9.42	10.45	8.17
Highest per cent bitumen.....	11.71	12.20	11.79
Sand: Per cent retained on sieves having—			
10 mesh per linear inch.....	.2	1	.3
20 mesh per linear inch.....	2.2	4.2	4.9
40 mesh per linear inch.....	20.2	21.3	35.3
60 mesh per linear inch.....	30.4	28	30.7
80 mesh per linear inch.....	15	14.2	8.8
100 mesh per linear inch.....	14.3	10	5.4
Passing 100 mesh per linear inch.....	17.1	21.3	15.1

## WASHINGTON SPECIFICATIONS.

The inadequacy of the Washington specifications for asphalt paving, and I might say of all asphalt paving specifications, has been long recognized. The great difficulty in the past has been that cities have tried to bring under the same specifications various kinds of asphalt, all requiring different treatment, and in some cases different fluxes. Asphalts vary so in their composition and physical characteristics that it is impossible to write one specification that will cover them all, but it is my belief that these specifications have required too much; that is, it is unreasonable for cities to specify what kind of materials and what methods of treatment are to be used in producing the asphalt paving cement, so long as it is of suitable quality. All asphalt paving cements, when good, have certain physical properties which are somewhat similar, no matter from what asphalt or flux they may be made. After a careful study, both in practice and in the laboratory, of the physical properties of different asphalt paving mixtures, I have found that all successful ones have certain physical properties which can be determined by laboratory tests on the asphaltic cement. A good asphalt paving mixture when laid as a pavement must have the following properties:

(1) It must be composed of such a material that it will not crush or be ground away by traffic at any climatic temperature. To accomplish this the asphaltic cement which surrounds the sand grains must be pliable and elastic at all temperatures, for, if it were solid and rigid, the mixture would soon grind away.

(2) As an asphalt pavement is laid in one continuous sheet, it is necessary that the cement used be so ductile, even at the lowest temperature obtained, that the pavement may contract without cracking.

(3) It is also necessary that the pavement be so firm and hard at the maximum climatic temperature obtained as to withstand the passage of traffic without either being cut into so badly as to be objectionable or shoved to the side of the street.

(4) The paving mixture must be as dense as is possible so as to preclude the entrance of water into its voids, for if water enters and freezes the mixture is expanded and becomes spongy, and with the pavement in such a condition, especially if the asphaltic cement is not very pliable, it will wear away by abrasion.

(5) The pavement must not contain any material that is acted on by water, for even though it were possible to construct a paving mixture so dense as to preclude the entrance of water into it, yet the mixture being pliable under the passage of traffic, water will work into it if it contains any material that is readily attacked.

(6) The pavement must not contain an asphaltic cement that will age so rapidly as to cause the pavement to lose its pliability before a reasonable period of time.

These properties are principally dependent on the properties of the asphaltic cement from which the paving mixture is made; that is, the asphaltic cement must be so ductile at the minimum temperature obtained in the climate in which it is laid as to permit a contraction of the pavement without cracking, while at the same time it must not be rendered so fluid by the maximum climatic temperature as to produce a pavement objectionably soft. The asphaltic cement must possess the property of flowing at all temperatures to which it will be subjected. It is upon this property that the adhesiveness of an asphaltic cement depends. Comparing two asphaltic cements of the same degree of consistency, the one that approaches more closely to

being a true liquid possesses the greater adhesiveness. This is true not alone from observation, but is evident when we examine into why a bituminous cement is adhesive. The property of adhering is not chemical but purely mechanical, and the more fluid the cement is the more completely and perfectly will it flow into every cavity of the surface in which it is in contact, thus producing a more perfect bond or adhesion.

It must not be inferred from the above remarks that the cement which approaches more closely to the true liquid, and for this reason is more adhesive, is the more desirable for asphalt construction. This is not the case, for cements as they approach the condition of being perfect liquids are, as a rule, found to be more susceptible to changes in temperature, that is, more brittle in the cold and more softened by heat.

Besides these physical properties, the asphaltic cement must be able to withstand the heating to which it will be subjected in the process of manufacture into pavement, without having its physical properties materially changed, and must not be rapidly hardened, or so changed by age, as to lose its ductility and pliability in an unreasonably short period of time.

In the present specifications I have made a decided departure from all former ones, and entirely omitted anything relating to the asphalt or flux which is combined to make the asphaltic cement, and specify only physical tests on the finished asphaltic cement, which will indicate the properties, within the desirable limits that have just been mentioned. The specifications adopted for the asphaltic cement are as follows:

*Asphalt cement.*—The asphaltic cement must be practically free from water, and must be within the range of 40 and 70 penetration when tested at 77° F., the amount of penetration to be fixed by the Engineer Commissioner.

Preference will be given to an asphaltic cement that is not readily affected by the action of water, provided it is satisfactory in other respects. If an asphaltic cement is accepted that is affected by water, some provision satisfactory to the Engineer Commissioner must be made to guard against the results of such action, and such work must be included in the price bid.

The bitumen of the asphaltic cement must comply with the following tests:

1. It must be of such a consistency that when tested at 32° F. it will not show a hardness below 10 penetration, and when tested at 115° F. it will not be softer than 350 penetration.

2. When a prism of the bitumen 1 centimeter square and 5 centimeters long is tested for ductility at 77° F. it must draw out to a distance of 20 centimeters before breaking.

3. When the bitumen is heated in an open tin at a temperature of 300° F. for eighteen hours in a hot-air oven it must not show a loss by volatilization of over 5 per cent, and it must not have been hardened over 50 per cent by this heating.

The asphaltic cement must never be heated to a temperature that will injure it.

When the asphaltic cement contains over 5 per cent of material that will separate by subsidence while in a molten condition, it must be thoroughly agitated before drawing from storage, and while in use in the supply kettles, so as to insure a uniform cement.

These tests shall be made by uniform methods, descriptions of which are on file in the office of the Engineer Commissioner.

It is my belief that these specifications cover all asphaltic cements that have been offered for paving and that are desirable. They do not, however, cover all hypothetical cases; for instance, an asphalt might be met with which, though passing the requirements of these specifications for ductility, would be too lacking in this property at temperatures lower than 77° F. Another point that might be raised is that they apparently specify no test to determine the rapidity of the aging of the asphaltic cement. But I have found it invariably to be the rule that the cement passing the requirements of the test for the amount of hardening resulting from heating in an open tin at 300° F. for eighteen hours does not objectionably harden or dry out on aging. I feel, however, that they would be more complete and satisfactory if they met every conceivable case, and believe, without doubt, that specifications can be made in time that will do this, after further experience with tests that are being made.

Very respectfully,

A. W. Dow,  
*Inspector of Asphalts and Cements.*

Maj. JOHN BIDDLE,  
*Corps of Engineers, U. S. Army,*  
*Engineer Commissioner, District of Columbia.*  
(Through Capt. H. C. Newcomer.)

## REPORT OF THE ASSISTANT ENGINEER IN CHARGE OF STREET EXTENSIONS.

WASHINGTON, October 7, 1903.

SIR: I have the honor to submit the following report of the work on street extensions for the fiscal year ending June 30, 1903:

No street extensions were authorized by special acts of Congress, and the only condemnations were for the opening of alleys in squares 514, 899, and 973.

Reports, estimates, and maps have been made on the various bills or requests for street opening or extensions.

Under authority of an amendment to the "highway act" a plan of readjustment of streets in the vicinity of Fourth street east and the Bunker Hill road was made during the year and recorded in the office of the surveyor, District of Columbia.

The special maps of this office relating to subdivisions and records of highways have been added to from time to time, so as to keep the latest record, and a number of them have been lithographed for use in the various departments of the District government.

Very respectfully,

WM. P. RICHARDS,  
*Assistant Engineer.*

Maj. JOHN BIDDLE,  
*Corps of Engineers, U. S. Army,  
Engineer Commissioner, District of Columbia.*

## REPORT OF ASSISTANT ENGINEER IN CHARGE ROCK CREEK PARK.

WASHINGTON, October 7, 1903.

SIR: I have the honor to submit the following report of the operations in Rock Creek Park during the fiscal year ending June 30, 1903:

The annual appropriation for the past year was the smallest made since the various improvements in the park were begun. It was not sufficient to allow needed repairs to the macadam roads, and was used sparingly in places where absolutely demanded.

Beach driveway was repaired for a distance of 1,000 feet on each side of the boulder bridge, and a cover of fine stone placed upon it. High water during the past winter occasioned repairs at various points on Beach driveway and to the temporary bridges north of the military road. A small amount of the appropriation was used on Ross road for team hire and the purchase of material. Much of what has been accomplished during the year has therefore depended on the operations of the chain gang. Grading has progressed along Ross road for a distance of 3,000 feet, requiring the removal of several thousand cubic yards of earth, there being heavy cuts and fills in places. Banks have been sloped and sodded, and grass and weeds have been kept down by the gang along all the improved drives. During the winter, when it was impossible to do much grading, a rustic viaduct was constructed by the gang on the line of Ross road across a deep ravine. This viaduct measures 170 feet in length, and is 45 feet high at its center. The flooring rests on ten trestles, well braced, and two abutments made of logs. The trestles rest on sills, which are embedded in concrete for their preservation. The viaduct is built of rather heavy timbers, and on account of lack of facilities and hoisting apparatus its construction proved a heavy undertaking. It stands as a creditable example of what the gang is capable of doing, and of the excellent way in which the foreman has handled the men.

## WORK RECOMMENDED FOR THE FISCAL YEAR 1905.

In submitting an estimate of work for the next fiscal year I can only repeat what I recommended in my last report, leaving out, of course, work that will be accomplished this year and making one or two changes in the interest of economy.

The completion and repair of Beach driveway, together with a bridge at the north end of the park, calls for the largest item of expense and will give the greatest benefit for the amount expended. Unless some appropriation is made for work in the northern end of the park the dirt road will soon have to be shut off from travel, as the temporary bridges are becoming dangerous and the road impassable in places. This would leave the largest part of the park without any access, as no other road leads through it north of the military road.

It is intended during the present year to construct a walk along the creek from the Zoological Park as far as Pierce Mill. This should be extended next year to the military road, so that the most accessible part of the park will be open to pedestrians, who are beginning to feel the need of some path other than along the present drives.

Very respectfully,

WM. P. RICHARDS,  
*Assistant Engineer.*

Maj. JOHN BIDDLE,  
*Corps of Engineers, U. S. Army,  
Secretary Board of Control, Rock Creek Park.*

*Estimates.*

Completing the grading and macadamizing of Beach driveway, 11,000 feet in length:	
Grading 10,000 cubic yards, at 25 cents.....	\$2,500
Macadamizing 5,000 cubic yards, at \$3.....	15,000
Gutters, 3,700 cubic yards, at 50 cents.....	1,850
One arch across Rock Creek to replace temporary bridge.....	15,000
Completing Ross road, 6,000 feet long.....	10,000
Completing roadway leading from north end of Daniels road to Beach driveway.....	5,000
Grading and macadamizing Milk House ford road from Rock Creek to Daniels road.....	3,000
Protecting Rock Creek banks.....	5,000
Footpaths and shelters.....	5,000
Cost of running two sprinklers 150 days, at \$7.....	1,050
Care and repair of present macadam roads.....	5,000
Engineering, inspection, etc.....	5,000
Total.....	73,400

REPORT OF THE SUPERINTENDENT OF PROPERTY.

WASHINGTON, September 15, 1903.

SIR: I have the honor to forward herewith detailed statement in quadruplicate as of July 1, 1903, showing expenditures of the property division of the engineer department for the fiscal year ending June 30, 1903:

Construction material purchased.....	\$280,277.27
Miscellaneous purchases.....	\$119,117.04
Cast-iron pipe and special castings (water department).....	263,930.21
Hauling pipe and castings (water department).....	2,346.34
	385,393.59
List of employees other than those on per annum rolls, and amounts paid to each.....	22,363.39
Total.....	688,034.25

Very respectfully,

R. D. SIMMS,  
*Superintendent of Property.*

Maj. JOHN BIDDLE,  
*Corps of Engineers, U. S. Army,  
Engineer Commissioner, District of Columbia.*

# 102 OPERATIONS OF THE ENGINEER DEPARTMENT, D. C.

STATEMENT No. 1.—Showing amount of construction material purchased for issue from the District of Columbia property yards during the year ending June 30, 1903.

	Quantity.	Value.
Terra-cotta sewer pipe, branches, and bends:		
24-inch sewer pipe.....feet.....	2, 774	\$2, 221.25
21-inch sewer pipe.....do.....	2, 895	1, 794.90
18-inch sewer pipe.....do.....	4, 907	2, 062.01
15-inch sewer pipe.....do.....	6, 041	1, 994.39
12-inch sewer pipe.....do.....	18, 493	4, 466.35
10-inch sewer pipe.....do.....	7, 558	1, 523.35
8-inch sewer pipe.....do.....	5, 761	722.68
6-inch sewer pipe.....do.....	12, 924	969.39
6-inch sewer-pipe bends.....number.....	259	80.73
Vitrified sewer invert bricks.....do.....	474, 309	6, 896.45
Vitrified sewer invert blocks.....feet.....	592	195.51
Re-pressed vitrified paving blocks.....number.....	906, 213	18, 348.53
Vitrified paving bricks.....do.....	11, 955	289.08
Vitrified sewer invert bricks, specials Nos. 1 and 2.....do.....	105, 638	4, 225.82
Red sewer bricks.....do.....	757, 846	7, 467.51
Asphalt paving blocks.....do.....	394, 967	23, 637.48
Portland cement.....barrels.....	40, 159	77, 269.75
Natural cement.....do.....	4, 289	3, 077.28
Paving and concrete sand.....cubic yards.....	6, 932	8, 812.46
Screened sand.....do.....	682	443.14
Screened pebbles.....do.....	3, 102	2, 698.89
Curbing.....linear feet.....	79, 700	56, 483.83
Castings.....		4, 714.32
Water boxes.....number.....	400	226.00
Siphons.....do.....	4	103.43
Broken stone.....cubic yards.....	30, 074	29, 472.44
Freight on broken stone.....		16, 216.50
Hauling broken stone.....		6, 967.25
Blue-stone basin tops.....number.....	12	192.00
Storage on cement.....		1, 714.72
Total.....		280, 277.27

STATEMENT No. 2.—Showing miscellaneous purchases made during the year ending June 30, 1903.

Awnings purchased and repaired.....	\$9.00	Lumber.....	\$19, 861.78
Accountant, registering.....	250.00	Leather, straps.....	54.00
Aquaphone.....	6.20	Matting, rubber.....	62.20
Badges, and repairs to.....	17.00	Mixer, concrete.....	225.00
Barrels.....	20.50	Maps.....	141.30
Beams, I.....	88.44	Oils, illuminating, engine, etc.....	2, 927.29
Blank forms, printing and binding.....	2, 897.06	Paints, glass, and oil.....	3, 978.90
Books, made to order.....	898.63	Photographic supplies.....	146.51
Blocks, pulley.....	119.94	Pitch.....	1, 323.08
Blueprints.....	416.46	Plows, and repairs to.....	280.10
Boots, rubber.....	188.10	Plumbers' supplies.....	3, 277.56
Castings.....	4, 652.88	Patterns for castings.....	59.75
Chemist's supplies.....	183.05	Quartz.....	15.77
Cars, platform.....	480.00	Saddlery.....	851.28
Cement, asphalt.....	74.00	Sand (special).....	3.30
Clocks.....	2.50	Screenings, limestone.....	126.11
Cots.....	8.00	Sills, stone.....	19.68
Drafting materials.....	312.62	Slate.....	130.00
Drugs.....	261.81	Seed, grass.....	73.09
Dry goods.....	67.53	Stationery.....	1, 716.91
Derricks.....	140.00	Surveyor's instruments, and repairs to.....	467.56
Engines, machinery, etc.....	8, 774.47	Stone, binder.....	375.42
Electrical supplies.....	6, 812.89	Subscriptions, magazines, etc.....	17.50
Forage.....	12, 364.35	Tinware.....	2, 189.41
Fuel.....	14, 195.28	Tile.....	8.40
Furniture.....	1, 553.09	Tickets, street-car.....	324.00
Fertilizer.....	48.50	Tools, and repairs to.....	3, 720.69
Furnaces.....	160.00	Typewriters.....	271.50
Freight.....	40.24	Wagons, carts, buggies, and repairs to.....	788.60
Groceries.....	94.35		
Hardware.....	7, 946.12		
Hose.....	1, 535.03		
Horses.....	1, 200.00	Special castings, pipe, etc. (water department).....	263, 990.21
Hauling, bricks, curbing, etc.....	2, 332.04	Hauling, castings, pipe, etc. (water department).....	2, 346.34
Hire, horse.....	120.00		
Ice.....	38.91		
Lead, pig.....	7, 302.59	Total.....	\$85, 393.59
Lime, hair and mortar.....	117.92		

**OPERATIONS OF THE ENGINEER DEPARTMENT, D. C. 103**

**STATEMENT No. 3.**—*Showing list of employees other than those on the per annum rolls, amount paid each, and the various appropriations from which such payments were made.*

	Rate.	Improvements and repairs.	Deposit and assessment fund.	Assessment and permit work sewers.	Cleaning and repairing sewers and basins.	Main and pipe sewers.	Suburban sewers.	Extension boundary sewer.
Superintendent of property .....	\$6.00	\$1,338.00	.....	\$156.00	\$78.00	.....	.....	.....
Assistant superintendent of property .....	5.00	1,115.00	.....	130.00	65.00	.....	.....	.....
3 clerks .....	4.00	2,569.00	.....	247.00	143.00	.....	.....	.....
2 clerks .....	3.00	1,322.00	.....	69.00	71.50	.....	.....	.....
2 inspectors .....	4.00	1,556.00	.....	104.00	104.00	.....	.....	.....
Do .....	3.00	1,344.00	.....	114.00	70.50	.....	.....	.....
1 inspector .....	3.25	669.75	.....	84.50	42.25	.....	.....	.....
Do .....	2.00	422.00	.....	50.00	26.00	.....	.....	.....
2 blacksmiths .....	{ 3.25 2.50 }	280.91	\$69.00	149.50	73.88	\$418.33	\$289.64	\$94.75
Wheelwright and painter .....	2.50	135.00	30.00	61.25	57.90	257.15	135.26	65.00
Labor .....	.....	530.40	251.00	245.51	106.74	802.06	791.00	136.76
Messenger-clerk .....	2.00	370.00	.....	50.00	26.00	.....	.....	.....
Messenger .....	1.75	376.25	.....	21.00	22.75	.....	.....	.....
Lumber inspector .....	3.00	.....	.....	.....	.....	.....	6.00	.....
<b>Total .....</b>	.....	11,998.31	350.00	1,481.76	886.52	1,477.54	1,221.90	296.51

	Rate.	East side intercepting sewer to Twelfth street.	Georgetown trunk sewer.	Low area trunk sewer.	Sewage disposal pumping station.	B street and New Jersey avenue trunk sewer.	Water department.	
Superintendent of property .....	\$6.00	.....	.....	.....	.....	.....	\$76.91	\$151.09
Assistant superintendent of property .....	5.00	.....	.....	.....	.....	.....	64.09	125.91
3 clerks .....	4.00	.....	.....	.....	.....	.....	153.83	302.17
2 clerks .....	3.00	.....	.....	.....	.....	.....	41.20	138.80
2 inspectors .....	4.00	.....	.....	.....	.....	.....	.....	96.00
Do .....	3.00	.....	.....	.....	.....	.....	.....	135.00
1 inspector .....	3.25	\$38.36	.....	.....	.....	.....	.....	78.00
Do .....	2.00	.....	.....	.....	.....	.....	25.64	50.36
2 blacksmiths .....	{ 3.25 2.50 }	80.66	\$37.29	\$110.06	\$99.58	\$23.79	.....	69.00
Wheelwright and painter .....	2.50	10.62	27.83	29.05	59.37	36.59	.....	38.75
Labor .....	.....	165.88	82.63	156.40	136.56	87.37	.....	114.00
Messenger-clerk .....	2.00	.....	.....	.....	.....	.....	7.83	44.67
Messenger .....	1.75	.....	.....	.....	.....	.....	.....	40.25
Lumber inspector .....	3.00	.....	.....	.....	.....	.....	.....	.....
<b>Total .....</b>	.....	295.51	147.75	295.51	295.51	147.75	369.00	1,384.00

# 104 OPERATIONS OF THE ENGINEER DEPARTMENT, D. C.

STATEMENT No. 3.—*Showing list of employees other than those on the per annum rolls, amount paid each, etc.*—Continued.

	Rate.	Purchase and repairs to pumps, water department.	Buildings and grounds.					
			8-room school building, Trinidad, sixth division.	8-room school building, tenth division.	8-room school building, third division.	8-room school building, ninth division.	Station house and stable, southeast Washington.	House and furniture, truck company, southeast Washington.
Superintendent of property	\$6.00		\$19.50	\$19.50	\$19.50	\$19.50		
Assistant superintendent of property	5.00		16.25	16.25	16.25	16.25		
3 clerks	4.00		13.00	13.00	13.00	13.00	\$14.00	\$80.00
2 clerks	3.00	\$36.00	17.25	17.25	17.25	17.25	6.00	
2 inspectors	4.00	56.00						
Do	3.00						39.00	
1 inspector	3.25		10.56	10.56	10.56	10.57		
Do	2.00						23.50	2.25
2 blacksmiths	{ 3.25 2.50 }							
Wheelwright and painter	2.50							
Messenger-clerk	2.00							
Messenger	1.75		5.69	5.69	5.69	5.68		
Lumber inspector	3.00							
Total		92.00	82.25	82.25	82.25	82.25	82.50	82.25

	Rate.	Buildings and grounds.		Repairs.				Electric department.	
		House, lot, and furniture, chemical engine company, Congress Heights.	4-room school building and site, seventh division, Congress Heights.	Engine houses.	Police stations.	Schools.	Market houses.	Street lighting.	General expenses.
Superintendent of property	\$6.00								
Assistant superintendent of property	5.00								
3 clerks	4.00								
2 clerks	3.00								
2 inspectors	4.00		\$52.00						
Do	3.00		27.00	\$1.50		\$33.00		\$78.00	\$6.00
1 inspector	3.25			19.50					45.50
Do	2.00		.25			26.00			
2 blacksmiths	{ 3.25 2.50 }								
Wheelwright and painter	2.50								
Labor					\$39.25	121.00	\$19.50		31.00
Messenger-clerk	2.00					26.00			20.00
Messenger	1.75					22.75		24.50	
Lumber inspector	3.00	\$3.00		18.00		24.00			
Total		3.00	79.25	39.00	39.25	252.75	19.50	102.50	102.50

**OPERATIONS OF THE ENGINEER DEPARTMENT, D. C. 105**

**STATEMENT No. 3.**—*Showing list of employees other than those on the per annum rolls, amount paid each, etc.*—Continued.

	Rate.	Parking commis- sion.	Contingent expenses, engineer stables.	Maintain- ing public order, 1903.	Industrial instruction, public schools.	Girls' cot- tage, Indus- trial Home School.	Total.
Superintendent of property.....	\$6.00						\$1,878.00
Assistant superin- tendent of property	5.00						1,565.00
3 clerks.....	4.00						3,561.00
2 clerks.....	3.00						1,753.50
2 inspectors.....	4.00						1,948.00
Do.....	3.00						1,848.00
1 inspector.....	3.25						1,010.10
Do.....	2.00						626.00
2 blacksmiths.....	3.25 2.50		\$163.94	\$36.25			1,996.58
Wheelwright and painter.....	2.50		145.00				1,068.77
Labor.....		\$66.35	41.13	\$3.75			3,945.19
Messenger-clerk.....	2.00						544.00
Messenger.....	1.75						530.25
Lumber inspector.....	3.00				\$15.00	\$3.00	69.00
Total.....		55.25	350.07	70.00	15.00	3.00	22,363.39

**REPORT OF THE PERMIT CLERK.**

WASHINGTON, August 25, 1903.

SIR: I have the honor to submit the annual report of the operations of the permit clerk's office, giving in detail the character and number of permits issued during the fiscal year ended June 30, 1903.

Permits issued for which fees were paid, as shown by the receipt of the collector of taxes, District of Columbia, on applications therefor, were:

Water connection .....	1,459
Water repairs .....	899
Sewer connections.....	1,520
Sewer repairs .....	1,035
Gas and electric lighting connections.....	1,398
Gas and electric lighting repairs.....	134
Gas mains, lay .....	63
Electric conduits, lay or repair:	
Chesapeake and Potomac Telephone Company .....	329
Potomac Electric Power Company.....	61
Western Union Telegraph Company.....	1
Postal Telegraph-Cable Company .....	2
Conduits:	
Connect with telephone.....	12
Connect with sewers .....	127
Carriage blocks, place at curb .....	1
Excavations (miscellaneous) .....	8
Fences, erect to inclose parkings .....	356
Guard stones, place in alleys.....	3
Hitching posts, place at inner edge of curb.....	6
Lamps:	
Place on or over sidewalks.....	51
Repair in parking .....	1
Manholes, adjust to grade.....	7
Poles, erect or replace telegraph and telephone.....	448
Private conduit, lay (public, 247, 1900) .....	1
Railway conduits:	
Connect with electric-power conduit.....	1
Connect with sewers to drain .....	7
Total paid permits .....	7,930

# 106 OPERATIONS OF THE ENGINEER DEPARTMENT, D. C.

Permits issued without fee were:	
Water specials .....	315
Sewer specials .....	609
Electric-lighting specials.....	14
Gas specials .....	23
Conduit, connection with (Chesapeake and Potomac Telephone Company) ..	1
Excavations .....	2
Alleys:	
Close temporarily .....	9
Grade .....	4
Remove pavement temporarily.....	3
Bridges:	
Attach guy rope to pier.....	1
Haul over loads exceeding 5 tons in weight .....	3
renew cables on .....	1
repair .....	2
Copings, build or repair at back of sidewalk .....	233
Connect with overhead wires:	
Potomac Electric Power Company.....	26
Chesapeake and Potomac Telephone Company .....	76
Cables:	
String aerial .....	84
Remove aerial.....	1
Curb, lower at driveway.....	1
Drain pipes, lay.....	2
Driveways, lay or repair .....	42
Engines, move by own power over streets.....	17
Engine house, attach wall guy to .....	1
Excavate in alleys.....	3
Fences:	
Repair along roadway .....	1
Repair inclosing parkings .....	501
Put 8-foot board on District of Columbia property .....	1
Frames, erect display.....	2
Guard rail, erect on side of terrace steps .....	1
Gutters:	
Bridge.....	14
Remove .....	1
Clean.....	1
Cut asphalt to waterproof vault .....	1
Haul across sidewalk.....	85
Leads:	
Lay across parkings.....	690
Repair across parkings.....	318
Manhole cover, repair.....	1
Material:	
Fill in streets.....	9
Store in streets.....	1
Take from streets.....	32
Parkings:	
Grade .....	189
Occupy temporarily.....	19
Pave or repave .....	54
Store material for District of Columbia use .....	1
Parking pavement, remove.....	3
Poles:	
Erect railroad telegraph .....	1
Take down abandoned.....	1
Roadways:	
Close temporarily.....	3
Drive pins in.....	1
Grade and repair.....	10
Tunnel.....	8
Sidewalks:	
Lay .....	82
Repair.....	59
Occupy for business purposes .....	25

Sidewalks—Continued.

Space grade.....	9
Tunnel.....	1
Steps in parking, construct or repair.....	448
Stopcock boxes, adjust to grade.....	28
Tar kettle, place in street.....	1
Trees:	
Attach guys to.....	10
Remove.....	47
Trees and boxes, paint or whitewash.....	49
Tree spaces:	
Inclose with wire.....	2
Lay leads across.....	20
Pave.....	3
Tiling, replace.....	1
Use dynamite in public space.....	1
Water tables, lay or repair.....	87
Walls, erect or repair on parking.....	31
Wires:	
String guy.....	5
String overhead.....	73
Monthly, to repair existing overhead.....	19
String for telephone purposes only.....	66

RAILROAD COMPANIES.

Anacostia and Potomac River.....	6
Capital Traction.....	6
City and Suburban.....	1
East Washington Heights Traction.....	2
Georgetown and Tennallytown.....	1
Washington Railway and Electric.....	14
Baltimore and Ohio.....	8
Chesapeake Beach.....	1
Philadelphia, Baltimore and Washington.....	30

UNITED STATES GOVERNMENT.

Department of Agriculture.....	2
Government Hospital for Insane.....	3
Government Printing Office.....	2
Officer in charge of public buildings and grounds.....	5
United States Navy Department.....	1
United States Treasury Department.....	2
Washington Aqueduct, officer in charge of.....	2

Grand total..... 12,559

There has been an increase of 1,063 in the number of permits issued as compared with the fiscal year ended June 30, 1902, also in the amount of money paid to the collector of taxes, District of Columbia office, for fees as will be shown by his report.

Permits issued during the fiscal year:

1901-2.....	11,496
1902-3.....	12,559

The following table shows the number of permits issued during the last five years, and the amount of money paid for permit fees to the collector of taxes, District of Columbia, during that time:

Fiscal year.	Permits issued.	Fees paid.
1898-99.....	11,330	\$7,692
1899-1900.....	10,569	6,797
1900-1901.....	10,522	6,588
1901-2.....	11,496	7,338
1902-3.....	12,559	7,980

One thousand six hundred and forty-one communications have been referred to this office, briefs made on cards, the permits necessary written, the papers indorsed

# 108 OPERATIONS OF THE ENGINEER DEPARTMENT, D. C.

with action taken and returned to the record office of the engineer department, or through that office to the division having charge of the inspection of the work for which the permits were issued.

Very respectfully,

H. M. WOODWARD,  
Permit Clerk, District of Columbia.

Maj. JOHN BIDDLE,  
Corps of Engineers, U. S. Army,  
Engineer Commissioner, District of Columbia.

## REPORT OF THE CHIEF CLERK.

WASHINGTON, July 1, 1903.

MAJOR: I have the honor to submit the following report for the fiscal year ended June 30, 1903:

Communications received, briefed, recorded, and acknowledged.....	11,409
Indorsements, references, and reports thereon .....	57,045
Letters and orders prepared.....	3,425
Copies of contracts drawn.....	584
Vouchers and bills prepared, recorded, and forwarded.....	5,787

Schedules of bids received during the fiscal year for work and materials furnished, and statements of contracts for street improvements, sewers, buildings, construction material, supplies, and miscellaneous work are herewith.

The following is a list of employees in the record office who are paid from various appropriations:

Title.	Rate.	Appropriations.	Period.
	<i>Per day.</i>		
One clerk .....	\$4.50	Surface, sewer, and water divisions.....	Four months each.
Three clerks.....	4.00	.....do.....	Do.
One clerk.....	3.50	.....do.....	Do.

Very respectfully,

A. Y. LAKENAN,  
Chief Clerk, Engineer Department, District of Columbia.

Maj. JOHN BIDDLE,  
Corps of Engineers, U. S. Army,  
Engineer Commissioner, District of Columbia.

*Schedule of proposals for construction of portion of B street and New Jersey avenue trunk sewer; opened August 30, 1902.*

### SECTION A.

Bidders.	Ordinary excavation.	Red brick masonry, Portland cement.	Vitrified masonry, Portland cement.	Concrete masonry, "B."	Concrete masonry, "C."	6-inch diameter pipe.	Section B. complete.
B. J. Sullivan .....	\$1.14	\$9.25	\$17.00	\$6.50	\$6.10	\$1.00	\$50,000.00
Andrew Gleeson.....	1.15	10.00	20.00	6.90	6.40	.15	49,995.00
G. H. Cole & Co .....	1.60	12.00	21.00	8.50	8.00	.25	64,006.00

### SECTION C.

Bidders.	Ordinary excavation.	Red brick masonry, Portland cement.	Vitrified masonry, Portland cement.	Concrete masonry, "B."	Concrete masonry, "C."	6-inch diameter pipe.	Total cost.
B. J. Sullivan.....	\$1.14	\$9.25	\$17.00	\$6.50	\$6.10	1.00	\$200,596.50
Andrew Gleeson.....	1.20	10.00	22.00	7.90	6.90	.15	207,741.65
G. H. Cole & Co .....	1.60	12.00	21.00	8.50	8.00	.25	265,006.25

# OPERATIONS OF THE ENGINEER DEPARTMENT, D. C. 109

*Schedule of proposals received September 13, 1902, for the construction of sewers.*

## SEWER A.

Bidders.	Ordinary excavation.	Rock excavation.	Embankment over sewer.	Red brick masonry.	Vitrified brick masonry.	Concrete masonry, "B."	6-inch diameter pipe.	Total cost.
Coyle & Co.....	\$0.44	\$2.50	\$0.23	\$13.40	\$17.00	\$6.70	\$0.15	\$24,591.80
Andrew Gleeson .....	.65	2.70	.30	12.00	22.00	6.75	.25	27,360.00
Warren F. Brenizer Co.....	.55	3.50	.25	13.20	17.20	7.85	.15	28,079.60
Lyons Bros.....	.60	5.00	.25	13.05	17.00	7.65	.25	28,656.60
M. F. Talty.....	.90	4.00	.40	13.00	20.00	6.50	.20	28,936.00

## SEWER B.

[Thirteenth street SW., between B street and Potomac River.]

Bidders.	Ordinary excavation.	Red brick masonry.	Vitrified brick masonry.	Concrete masonry, "D."	Invert block.	24-inch pipe.	21-inch pipe.	Total.
M. F. Talty .....	\$1.00	\$13.00	\$20.00	\$6.00	\$0.75	\$0.80	\$0.65	\$9,191.65
Warren F. Brenizer Co.....	1.00	13.20	17.20	6.75	.75	.98	.85	9,490.63
Coyle & Co.....	1.40	14.50	19.00	7.50	.80	1.05	.90	11,841.75
Andrew Gleeson.....	1.50	12.00	21.00	7.75	1.00	1.10	.90	12,495.68
Lyons Bros.....	1.00	15.00	20.00	9.00	21.00	1.10	1.00	26,876.50

## SEWER C.

[Through property Westminster College, Anacostia.]

Bidders.	Ordinary excavation.	Concrete masonry, "D."	Special red brick masonry.	Total cost.
M. F. Talty.....	\$0.55	\$6.00	\$15.00	\$1,321.50
Andrew Gleeson.....	.75	7.90	14.00	1,974.10
Lyons Bros.....	1.00	7.00	16.00	2,008.00
Warren F. Brenizer Co.....	1.25	6.85	13.95	2,085.90
Coyle & Co.....	1.50	8.50	17.00	2,494.00

## SEWER D.

[8 street NW., between Eighteenth and Nineteenth streets.]

Bidders.	Ordinary excavation.	Concrete masonry, D.	Red brick masonry.	Vitrified brick masonry.	Invert blocks.	Total cost.
Warren F. Brenizer Co.....	\$0.70	\$6.75	\$13.20	\$17.20	\$0.75	\$2,032.20
Jno. F. Joyce.....	.75	6.75	13.00	17.75	.70	2,055.50
Coyle & Co.....	.65	7.10	14.50	19.00	.90	2,130.65
M. F. Talty.....	1.00	6.00	13.00	20.00	.75	2,250.50
Andrew Gleeson.....	1.00	7.50	11.00	21.00	1.00	2,476.00
Lyons Bros.....	1.00	7.75	15.00	20.00	.80	2,481.00

## SEWER E.

[Fifth street NW., between Sumner and Morris roads and in Morris road.]

Bidders.	Ordinary excavation.	Red brick masonry.	24-inch pipe.	21-inch pipe.	Total cost.
Coyle & Co.....	\$0.45	\$14.00	\$0.95	\$0.85	\$2,733.75
Lyons Bros.....	.55	13.25	.97	.95	2,968.24
Warren F. Brenizer Co.....	.60	13.20	.99	.95	3,082.23
M. F. Talty.....	.80	13.00	.80	.65	3,091.00
J. F. Joyce.....	.90	14.00	1.50	1.40	4,501.90

# 110 OPERATIONS OF THE ENGINEER DEPARTMENT, D. C.

*Schedule of proposals received September 13, 1902, for the construction of sewers—Cont'd.*

## SEWER F.

[Hartford street NE. between Ninth and Thirteenth streets.]

Bidders.	Ordinary excavation.	Red-brick masonry.	24-inch pipe.	21-inch pipe.	15-inch pipe.	Total cost.
Warren F. Brenizer Co.....	\$0.60	\$13.20	\$0.99	\$0.95	\$0.85	\$2,222.55
Lyons Bros.....	.60	13.50	.98	.94	.80	2,291.28
Coyle & Co.....	.70	14.00	1.00	.90	.80	2,424.00
John F. Joyce.....	.65	14.00	1.50	1.40	1.20	2,919.55

*Schedule of proposals for construction of portion of low-area trunk sewer; opened November 15, 1902.*

Bidders.	Ordinary excavation.	Red-brick arch.	Red-brick invert and man-holes.	Vitrified-brick masonry.	Concrete masonry "B."	Concrete masonry "C."	6-inch pipe under-drain.	Total cost.
Warren F. Brenizer Co.....	\$1.50	\$12.00	\$14.25	\$20.00	\$8.50	\$8.40	\$0.30	\$73,665.50
Patterson & Brierson .....	1.60	13.50	15.00	17.00	9.00	8.00	1.00	80,645.00
E. G. Gummel .....	2.00	16.00	16.00	25.00	9.00	8.50	.30	92,650.00
Andrew Gleeson .....	2.45	14.00	14.00	24.00	11.00	10.00	.25	104,820.00

*Schedule of proposals for constructing sewer in Jefferson street, Anacostia, east of Taylor street; opened February 16, 1903.*

## SEWER A.

Bidders.	Ordinary excavation.	Red-brick masonry.	10-inch diameter pipe.	Total cost.
A. Gleeson .....	\$0.80	\$12.00	\$0.70	\$1,494.00
M. F. Talty .....	.85	15.00	.75	1,600.00
Lyons Bros.....	.95	14.00	.75	1,692.00

## SEWER B.

[Cathedral avenue between Connecticut avenue and Woodley road.]

Bidders.	Ordinary excavation.	Red-brick masonry.	24-inch diameter pipe.	Total.
M. F. Talty .....	\$0.65	\$14.00	\$1.25	\$2,468.00
A. Gleeson .....	.80	12.00	1.25	2,713.00
Lyons Bros.....	1.25	14.00	1.95	4,198.00

## SEWER C.

[Fifteenth street SW. between C and D streets; D street SW. between Fourteenth and Fifteenth streets, and Fourteenth street SW. between D and Maryland avenue.]

Bidders.	Ordinary excavation.	Red-brick masonry.	24-inch diameter pipe.	18-inch diameter pipe.	Total.
M. F. Talty.....	\$0.65	\$14.00	\$1.25	\$0.96	\$3,408.85
A. Gleeson .....	.70	12.00	1.25	.95	3,502.75
Lyons Bros.....	.95	14.00	1.90	1.75	5,118.00

# OPERATIONS OF THE ENGINEER DEPARTMENT, D. C. 111

*Schedule of proposals for constructing sewers; opened June 20, 1903.*

[Michigan avenue between Lincoln avenue and a point west; Harewood avenue, and Bunker Hill road.]

Bidders.	Ordinary excavation.	Red-brick masonry.	Vitrified-brick masonry.	Concrete masonry, "D."	Vitrified invert blocks.	24-inch pipe.	21-inch pipe.	A.
E. G. Gummel .....	\$0.60	\$15.25	\$21.00	\$6.50	\$0.90	\$1.26	\$1.19	\$14,084.90
Lyons Bros.....	1.25	13.75	21.00	8.00	.90	1.00	.90	19,496.50

[Fifth street NW. between G and K streets.]

Bidders.	Ordinary excavation.	Red-brick masonry.	Vitrified-brick masonry.	Concrete masonry, "D."	24-inch pipe.	B.
E. G. Gummel .....	\$0.60	\$14.75	\$20.00	\$5.75	\$1.15	\$6,229.65
Lyons Bros.....	1.00	12.00	20.00	8.00	1.00	8,142.00

[Sewer in Rock Creek Church road, and in Warder avenue.]

Bidders.	Ordinary excavation.	Red brick masonry.	Vitrified brick masonry.	Concrete masonry "D."	Vitrified block inverts.	18-inch pipe.	C.
E. G. Gummel .....	\$0.60	\$15.25	\$21.00	\$6.50	\$0.90	\$1.12	\$4,358.82
Lyons Bros .....	1.25	14.00	22.00	8.50	1.00	.90	5,969.90

[Sewer in Sixteenth street NW., between Grant and Sheridan streets.]

Bidders.	Ordinary excavation.	Red brick masonry.	21-inch pipe.	15-inch pipe.	D.
E. G. Gummel .....	\$0.60	\$15.00	\$1.15	\$1.00	\$1,714.45
Lyons Bros .....	1.00	12.00	1.00	.85	2,079.40

[Sewer in Detroit street NE., between Ninth and Twelfth streets.]

Bidders.	Ordinary excavation.	Red brick masonry.	24-inch pipe.	21-inch pipe.	E.
E. G. Gummel .....	\$0.75	\$16.00	\$1.35	\$1.27	\$2,684.43
Lyons Bros .....	1.50	14.00	1.25	1.00	3,704.75

*Schedule of proposals for constructing sewer in North Capitol and E streets and Second and F streets NE.; opened June 22, 1903.*

Bidders.	Ordinary excavation.	Red brick masonry.	Vitrified brick masonry.	Concrete masonry.	6-inch pipe.	Total.
B. J. Sullivan.....	\$1.25	\$12.00	\$19.50	\$7.40	\$0.50	\$40,687.50
E. G. Gummel .....	1.90	14.00	25.00	8.55	.60	52,472.50
Guiney & Cavan .....	1.50	15.00	25.00	10.50	.30	51,405.00
Andrew Gleeson.....	1.49	12.00	22.00	7.90	.50	44,845.00

# 112 OPERATIONS OF THE ENGINEER DEPARTMENT, D. C.

*Schedule of proposals received January 3, 1903, for construction of sewerage pumping station.*

	A. B. Stannard.	Brennan Construc- tion Co.	Geo. A. Fuller Co.	Penn Bridge Co.	Herman Probet.	Richardson & Burgess.	Andrew Gleason.
Earth excavation ..	\$1.10	\$0.73	\$1.09	\$1.09	\$0.95	\$1.11	\$1.00
Piling ..	.18	.16	.1775	.1775	.23	.18	.195
Broken stone base ..	2.50	2.00	2.20	2.20	2.15	2.25	1.95
Underdrains ..	.10	.15	.25	.25	.40	.255	.25
Concrete A ..	8.50	8.70	8.28	8.28	9.90	8.50	7.40
Concrete B ..	7.90	7.08	7.65	7.60	8.70	7.75	6.90
Concrete C ..	6.00	6.00	5.95	5.90	6.55	6.00	6.50
Red-brick masonry ..	9.00	12.58	14.00	14.00	12.50	14.25	12.00
Vitrified masonry ..	12.00	20.00	19.00	19.00	18.00	19.40	20.00
Steel work ..	.04	.03	.034	.0321	.04	.0333	.009
Cast-iron bedplates ..	.04	.025	.025	.022	.0357	.0225	.009
Screens ..	15.00	5.83	5.50	5.30	15.87	5.50	11.25
Floor grating ..	30.00	23.76	22.00	21.60	31.90	22.50	30.00
Cast-iron floor plates ..	40.00	22.28	21.00	20.25	50.60	21.06	35.00
Substructure ..	269,220.00	240,763.30	265,035.00	263,086.50	294,308.45	268,717.05	266,402.60
Superstructure ..	279,000.00	308,000.00	323,984.00	334,737.00	358,600.00	330,350.00	.....

*Schedule of proposals for furnishing elevators, Trumbull street pumping station; opened April 4, 1903.*

Bidders.	Price.
Warner Elevator Manufacturing Co.....	\$3,750
Marine Engine Machine Co.....	5,000
Otis Elevator Co.....	4,950

<sup>a</sup> Informal.

*Schedule of proposals received September 6, 1902, for furnishing coal and ash conveying equipment for Trumbull street pumping station.*

Bidders.	Amount.
John A. Mead & Co.....	\$17,000
Link Belt Engineering Co.....	18,500
W. J. Haskins .....	22,340
C. W. Hunt Co.....	31,900

*Schedule of proposals for equipment for sewerage pumping plant at Industrial Home School; received October 18, 1902.*

Bidders.	Cost.
Warren F. Brenizer Co .....	\$1,780.00

*Schedule of proposals for furnishing and erecting steel trestle over tracks of Baltimore and Ohio Railroad at Twenty-eighth and Avalon streets; received April 4, 1903.*

Bidders.	Cost.
Lauer & Harper Co.....	\$1,253.00
Penn Bridge Co .....	1,347.80
Jas. H. McGill.....	1,574.00
New Jersey Foundry and Machine Co.....	2,487.00

# OPERATIONS OF THE ENGINEER DEPARTMENT, D. C. 113

*Schedule of proposals received February 15, 1903, for furnishing lumber for repair of Aqueduct Bridge over Potomac River.*

Bidders.	Joists.	Flooring.
Thomas W. Smith.....	\$32.50	\$29.00
Church & Stephenson.....	53.50	33.50
W. T. Galliher & Bro.....	56.00	38.00

*Schedule of proposals for grading and regulating suburban streets and avenues; opened June 20, 1903.*

Bidders.	Grading.	Curb.	Curb.	Gutters.	Macadam.	Excess hauling.	Total.
	<i>Cu. yard.</i>	<i>Lin. foot.</i>	<i>Lin. foot.</i>	<i>Sq. yard.</i>	<i>Cu. yard.</i>	<i>Per mile.</i>	
G. B. Mullin.....	\$0.39	\$0.22	\$0.37	\$0.34	\$0.38	\$0.24	\$9,030.00
Cranford Paving Co.....	.44	.22	.27	.34	.50	.30	10,084.00

*Schedule of proposals received July 19, 1902, for improving Connecticut avenue west of Rock Creek.*

Bidders.	Grading.	Macadam.	Total.
G. B. Mullin.....	\$1.20	\$0.80	\$2,780.00
Martin McNamara.....	.98	.80	2,340.00
M. F. Talty.....	.97	.70	2,272.00

*Schedule of proposals for laying asphalt block pavements; opened July 26, 1902.*

Bidders.	Gravel base.	Natural cement, concrete base.
	<i>Square yard.</i>	<i>Square yard.</i>
Washington Asphalt Block and Tile Co.....	\$1.66	\$2.00
Brennan Construction Co.....	1.76	2.19

*Schedule of proposals for repairing asphalt pavements; opened June 13, 1903.*

Items.	Bidders.	One-year contract.	Two-year contract.	Four-year contract.
		<i>Sq. yd.</i>	<i>Sq. yd.</i>	<i>Sq. yd.</i>
Standard asphalt pavement, 6-inch base.	Brennan Construction Co.....	\$1.65	\$1.63	\$1.59
	Barber Asphalt Paving Co.....	1.615	1.615	1.61
	Cranford Paving Co.....	1.71	1.70	1.69
Standard asphalt surface, 2 1/2-inch.	Brennan Construction Co.....	1.69	1.68	1.63
	Barber Asphalt Paving Co.....	1.735	1.735	1.73
	Cranford Paving Co.....	1.87	1.85	1.85
Standard asphalt surface, 2 1/2-inch before compression.	Brennan Construction Co.....	.74	.69	.67
	Barber Asphalt Paving Co.....	.78	.78	.775
	Cranford Paving Co.....	.76	.73	.71
		<i>Cu. ft.</i>	<i>Cu. ft.</i>	<i>Cu. ft.</i>
Standard asphalt surface, measured in cart.	Brennan Construction Co.....	0.53	0.51	0.49
	Barber Asphalt Paving Co.....	.485	.485	.48
	Cranford Paving Co.....	.55	.54	.53
Asphalt binder, measured in cart.	Brennan Construction Co.....	.265	.26	.25
	Barber Asphalt Paving Co.....	.28	.28	.28
	Cranford Paving Co.....	.28	.28	.28
Total.....	Brennan Construction Co.....	\$99,650	\$96,150	\$92,850
	Barber Asphalt Paving Co.....	99,075	99,075	97,550
	Cranford Paving Co.....	103,650	102,000	99,650

# 114 OPERATIONS OF THE ENGINEER DEPARTMENT, D. C.

*Schedule of proposals for laying cement sidewalks in the District of Columbia; opened August 8, 1902.*

Bidders.	Class A.	Class B.	Total.
Brennan Construction Co .....	\$1.04	\$1.11	\$63.90
Stamsen & Blome .....	1.0775	1.0975	63.05
Colburn Paving Co .....	1.05	1.18	63.00
Cranford Paving Co .....	1.04	1.24	66.40
F. M. Kemp & Sons .....	1.09	1.23	68.30

*Schedule of proposals for constructing an addition to girls' cottage building at Industrial Home School; opened August 23, 1902.*

Bidders.	Amount
Burgess & Parsons .....	\$6.40
W. E. Mooney .....	6.70
Pavarini & Greer .....	6.80
John C. Louthan .....	6.90
Gleeson & Humphrey .....	7.30
Rezin W. Darby .....	7.50
D. F. Mockabee .....	7.50

*Schedule of proposals for constructing 8-room school building on Pierce street, between First street and New Jersey avenue NW.; received September 20, 1902.*

Bidders.	Amount No. 1.	Amount No. 2.
Gleeson & Humphrey .....	\$40,900	.....
D. F. Mockabee .....	41,173	.....
Pavarini & Greer .....	41,600	.....
John C. Louthan .....	41,975	.....
J. M. Dunn .....	43,409	.....
M. B. Casey (steam) .....	.....	\$1.00
W. W. Biggs (steam) .....	.....	5.50
H. I. Gregory (hot air) .....	.....	3.00
H. I. Gregory (heat regulating device) .....	.....	21

*Schedule of bids received September 20, 1902, for constructing 8-room school building at southeast corner Ninth and D streets NE.*

Bidders.	Amount No. 1.	Amount No. 2.
Pavarini & Greer .....	\$37,900	.....
D. F. Mockabee .....	39,969	.....
J. M. Dunn .....	38,528	.....
Gleeson & Humphrey .....	39,000	.....
W. H. McCray .....	40,600	.....
Burgess & Parsons .....	45,930	.....
M. B. Casey (steam) .....	.....	\$5.50
W. W. Biggs (steam) .....	.....	7.50
H. I. Gregory (hot air) .....	.....	3.50
H. I. Gregory (heat regulating device) .....	.....	21

*Schedule of proposals for constructing 4-room addition to Cranch school building at Twelfth and G streets SE.; opened January 15, 1903.*

Bidders.	Amount
Burgess & Parsons .....	\$19.50
Pavarini & Greer .....	19.30
Osterman & Butler .....	20.50
W. E. Morney .....	21.50

OPERATIONS OF THE ENGINEER DEPARTMENT. D. C. 115

*Schedule of proposals for constructing 8-room school building on Twenty-seventh street, between I and K streets NW.; opened January 31, 1903.*

Bidders.	Amount.
J. M. Dunn.....	\$36,620
Pavarini & Greer.....	37,000
Osterman & Butler.....	37,582
Burgess & Parsons.....	42,689
Gleeson & Humphrey.....	43,400

*Schedule of proposals for constructing 4-room school building at intersection of Hamilton and Naylor roads, Good Hope, D. C., opened February 7, 1903.*

Bidders.	Amount.
Osterman & Butler.....	\$20,187
W. E. Mooney.....	21,580
Pavarini & Greer.....	22,333
W. Rothwell.....	26,740

*Schedule of proposals for constructing 4-room school building, corner Howard and Emery streets, Reno, D. C.*

Bidders.	Amount.
Pavarini & Greer.....	\$17,865
W. E. Mooney.....	17,894
Burgess & Parsons.....	18,093

*Proposals received July 14, 1902, for constructing engine house, lot 2, block 1, Nichol avenue, Randle Park, Congress Heights, D. C.*

Bidders.	Amount.
J. M. Dunn.....	\$19,969
D. F. Mockabee.....	20,044
Gleeson & Humphrey.....	20,200
Pavarini & Greer.....	20,490
W. H. McCray.....	20,565
Arthur Cowsill.....	20,693

*Schedule of proposals for construction of a substation for police department at Tenleytown; received April 30, 1903.*

Bidders.	Amount.
Burgess & Parsons.....	\$4,516
Burgess & Parsons (alternative).....	4,466
Pavarini & Greer.....	4,768

*Schedule of proposals for constructing morgue on water front, SW.; received April 15, 1903.*

Bidders.	Amount.
Lyons Bros.....	\$4,193.50
Lyons Bros. (alternative).....	3,928.50
Pavarini & Greer.....	4,600.00

# 116 OPERATIONS OF THE ENGINEER DEPARTMENT, D. C.

*Schedule of bids for changes in plumbing, public schools District of Columbia, 1903; received July 26, 1902.*

Bidders.	Amidon.	Blair.	Maury.	Morse.	Twining.	Wormley.
James Nolan & Sons.....	\$4,875.00	\$4,590.00	\$4,698.00	\$4,660.00	\$5,225.00	\$4,420.00
Walter W. Daniels, Jr.....	3,725.00	3,650.00	3,600.00	3,660.00	3,980.00	4,050.00
Wm. Rothwell.....	4,515.00	3,880.00	4,262.00	4,645.00	4,649.00	4,330.00
M. B. Casey.....	4,585.00	4,435.00	4,433.00	4,510.00	4,673.00	4,633.00
E. J. Hannan.....	3,347.00	3,299.00	3,299.00	3,300.00	3,300.00	2,984.00
S. S. Shedd & Bro.....	4,665.75	4,382.50	4,466.75	4,616.50	4,933.00	4,145.00
Whelan & Dunigan.....	4,227.00	4,161.00	4,244.00	4,260.00	4,493.00	3,941.00
Hutchinson & McCarthy.....	3,604.00	3,449.00	3,498.00	3,564.00	3,778.00	3,575.00

*Schedule of bids received June 11, 1903, for making changes in plumbing of toilet rooms of Brookland School building.*

Bidders.	Amount.
Hutchinson & McCarthy.....	\$2,497
Wm. Rothwell & Son.....	2,464
Dunigan Plumbing Co.....	2,450
M. B. Casey Co.....	1,680

*Schedule of proposals received July 28, 1902, for installing boilers at Grant School.*

Bidders.	Amount.
National Electric Supply Co.....	\$1,661.20
W. W. Biggs Heating and Ventilating Co.....	2,163.00
W. H. Larman.....	2,275.00

*Schedule of proposals for installing two tubular boilers at Grant School; opened August 9, 1902.*

Bidders.	Amount.
Forsberg & Murray.....	\$1,844
W. H. Larman.....	1,850
W. W. Biggs Heating and Ventilating Co.....	1,981
National Electric Supply Co.....	2,040
W. H. McCuen & Co.....	2,120

*Proposals received July 3, 1902, for steam piping at Manual Training School No. 2, P street NW., between First and Third streets.*

Bidders.	Amount.
W. H. Larman.....	\$946
Warren W. Biggs.....	1,144
Warren W. Biggs (pipe covering).....	140
	1,284
Forsberg & Murray.....	1,231
Forsberg & Murray (pipe covering).....	160
	1,391
Cyrus B. Rees.....	1,169
Cyrus B. Rees (pipe covering).....	135
	1,304

# OPERATIONS OF THE ENGINEER DEPARTMENT, D. C. 117

*Schedule of proposals received August 12, 1902, for furnishing and installing gas engines and fans in schoolhouses.*

Schools.	H. I. Gregory.	Backus Water Motor Co.	Otto Gas Engine Works.
Morse .....	\$695.00	\$693.30	\$868.00
Twining .....	695.00	693.30	898.00
Brent .....	695.00	693.30	937.00
Maury .....	695.00	698.30	903.00
Amidon .....	695.00	693.30	903.00
Blair .....	695.00	698.30	900.00
Wormley .....	695.00	693.30	898.00
Banneker .....	695.00	693.30	887.00
Cook .....	695.00	727.70	891.00

*Schedule of proposals for furnishing glass blackboards at manual training schools, received August 13, 1902.*

## MCKINLEY MANUAL TRAINING SCHOOL.

Bidders.	Amount.	Square feet.
Warren & Dyer .....	\$1,493	1,678
Hugh Reilly .....	1,676	1,676

## ARMSTRONG MANUAL TRAINING SCHOOL.

Bidders.	Amount.	Square feet.
Warren & Dyer .....	\$2,549	2,865
Hugh Reilly .....	568	568

*Schedule of proposals for grading to rear and west of Western High School; received March 21, 1903.*

Bidders.	Price.	Cost.
Colburn Paving Co .....	\$0.28	\$1,960.00
G. B. Mullin .....	.33	2,310.00
T. S. Carmody Company .....	.37	2,590.00

*Schedule of proposals for furnishing Portland cement; opened March 13, 1903.*

	National Mortar Co.	Alpha Portland Cement Co.	J. G. Waters & Son.
Delivered at District of Columbia cement house .....	\$2.65	\$2.53	\$2.40
Delivered on tracks Baltimore and Ohio R. R. ....	2.61	2.48	2.35
Delivered on track Philadelphia, Wilmington and Baltimore R. R. ....	2.61	2.53	2.37

*Schedule of proposals for Portland cement; opened June 10, 1903.*

Bidders.	District of Columbia warehouse.		Baltimore and Ohio R. R.		Philadelphia, Wilmington and Baltimore R. R.	
	Wood.	Sacks.	Wood.	Sacks.	Wood.	Sacks.
Atlas Portland Cement Co .....	\$2.11	\$1.83	\$2.07	\$1.78	\$2.07	\$1.78
Martins Creek Portland Cement Co .....	2.00½	1.75½	1.94½	1.69½	1.94½	1.69½
Cranford Paving Co .....	2.40	2.08	2.34	2.04	2.38	2.05
National Mortar Co .....	2.13	1.82	2.13	1.82	2.08	1.78
Lehigh Portland Cement Co .....	2.04	2.20	2.00	2.15	2.00	2.15

# 118 OPERATIONS OF THE ENGINEER DEPARTMENT, D. C.

*Schedule of bids for furnishing cast-iron water pipe; opened August 16, 1902.*

Bidders.	Per ton.	Cost.
M. J. Drummond & Co .....	\$30.70	\$13,508.00
United States Cast Iron Pipe and Foundry Co .....	33.90	14,916.00
Dimmick Pipe Co. ....	36.80	16,192.00
Camden Iron Works .....	38.44	16,912.00

*Schedule of proposals for furnishing 30-inch cast-iron water pipe; received March 14, 1903.*

Bidders.	Cost per ton.	Total.
Dimmick Pipe Co. ....	\$35.00	\$22,738.00
M. J. Drummond & Co .....	34.80	22,620.00
United States Cast Iron Pipe and Foundry Co .....	36.70	34,136.00

*Schedule of proposals for furnishing water pipe; opened June 20, 1903.*

Bidders.	Prices.	
	8-inch.	12-inch.
M. J. Drummond & Co .....	\$32.40	\$31.65
United States Cast Iron Pipe and Foundry Co .....	33.70	33.70
Dimmick Pipe Co. ....	33.50	33.50
Camden Iron Works .....	35.90	35.90

*Schedule of proposals received September 6, 1902, for furnishing cast-iron water pipes and specials.*

Bidders.	Straight pipe.	Special.
	Per ton.	Per ton.
New Jersey Cast Iron Pipe and Foundry Co .....	\$32.70	\$117.00
Camden Iron Works .....	35.90	78.00

*Schedule of proposals received October 18, 1902, for furnishing cast-iron specials.*

Bidders.	Per ton.	Per pound.	Cost
Dimmick Pipe Co .....	\$90.00		\$12.158 8
Camden Iron Works .....	98.00		13.238 8
Warren Foundry and Machine Co .....		\$0.275	8.316 8

*Schedule of proposals received September 6, 1902, for furnishing gate valves and check valves.*

Bidders.	No. 1 and 7, 30-inch electric.	No. 2, hand.	No. 3, 48- inch elec- tric.	No. 4, 30- inch elec- tric.	No. 5, 24- inch elec- tric.
Coffin Valve Co., Boston, Mass .....	\$750.00	\$550.00	\$925.00	\$760.00	\$470.00
Chapman Valve Co., Indian Orchard, Mass.	898.00	621.00	1,081.00	920.00	645.00
Michigan Brass and Iron Works, Detroit, Mich .....	872.31	608.48	2,244.85	872.31	481.72
A. P. Smith Manufacturing Co., Newark, N. J .....	1,350.00	1,000.00	1,700.00	1,350.00	750.00

**OPERATIONS OF THE ENGINEER DEPARTMENT, D. C. 119**

*Schedule of proposals received September 6, 1902, for furnishing gate valves and check valves—Continued.*

Bidders.	Nos. 6, 9, 10, 11, 12, 24— inch hand.	No. 8, 30- inch hand.	No. 18, 20- inch hand.	30-inch check.	Total.
Coffin Valve Co., Boston, Mass.....	\$270.00	\$525.00	\$180.00	\$390.00	\$6,650.00
Chapman Valve Co., Indian Orchard, Mass.....	318.00	606.00	289.00	441.00	7,989.00
Michigan Brass and Iron Works, Detroit, Mich.....	224.72	603.48	186.25	637.71	8,498.02
A. P. Smith Manufacturing Co., Newark, N. J.....	470.00	1,000.00	250.00	1,250.00	12,350.00

*Schedule of proposals received October 18, 1902, for furnishing cast-iron lamp-posts.*

Bidders.	Price per post.
Chas. White & Co.....	\$7.35
The Weaver-Hirsh Co.....	7.38
Stuart R. Carr & Co.....	7.90
Belmont Iron Works.....	7.98
M. J. Drummond & Co.....	10.00

*Schedule of proposals received December 6, 1902, for curb and corporation cocks.*

Bidder.	Curb cocks.	Corporation cocks.		
		½-inch.	¾-inch.	1-inch.
H. Mueller Manufacturing Co.....	\$0.95	\$0.49	\$0.65	\$1.35
A. P. Smith Manufacturing Co.....	1.10	.57	.85	1.00

*Schedule of proposals for furnishing repressed vitrified sewer invert bricks.*

Bidder.	Vitrified invert sewer brick No. 1.	Vitrified invert sewer brick No. 2.
Mack Manufacturing Co.....	Per M. \$40	Per M. \$40

*Schedule of proposals received July 26, 1902, for underground signal telephone cables.*

	Standard Under- ground Ca- ble Co.	Chesa- peake and Potomac Telephone Co.	Jno. A. Roebling's Sons Co.
20-pair telephone cable.....	\$0.205	\$0.184	\$0.195
25-pair telephone cable.....	.245	.218	.23
15-pair signal cable.....	.26	.264	.2375
12-pair signal cable.....	.23	.241	.205
6-pair combination cable.....	.186	.276	.175
5-pair combination cable.....	.165	.23	.155
3-pair combination cable.....	.13	.184	.115

*Schedule of proposals received September 6, 1902, for naphtha street lighting.*

Bidders.	Per lamp per annum.
American Development Co.....	\$19.65
American Lighting Co.....	19.70
Union Lighting Co.....	19.80
Pennsylvania Globe Gas Light Co.....	20.00

# 120 OPERATIONS OF THE ENGINEER DEPARTMENT, D. C.

*Schedule of proposals received to furnish and erect metallic file cases and book racks for office of registrar of wills; opened July 10, 1902.*

Bidders.	Amount.
Art Metal Construction Co .....	\$1,965
Woodruff Manufacturing Co .....	1,996

## *Statement of contracts for construction of sewers for fiscal year 1903.*

No.	Date.	Name and address of contractor.	Location.	Character of work.
3165	1902. Sept. 12	B. J. Sullivan, Philadelphia, Pa.	New Jersey avenue SE. between N and I.	Construct 980 feet of 16 by 18 foot; 9 by 10 foot 6 inch; 600 feet of 15 by 17 foot sewer.
3168	Oct. 1	Cayle & Co.....	New Jersey avenue SE. between I street and Garfield Park. Georgetown College grounds .....	Construct 315 feet of 15 by 17 foot sewer. Construct 2,605 feet of 6-foot sewer.
3170	Oct. 1	M. F. Talty.....	Fifth street NW. between Sumner street and Morris road, and in Morris road between Fifth street and alley. Thirteenth street SW. between B street and Potomac River.	Construct 1,357 feet of 24-inch pipe sewer. 336 feet of 21-inch pipe sewer. Construct 130 feet of 3 by 4 foot sewer; 830 feet of 2.75 by 4.15 foot sewer; 410 feet of 24-inch pipe sewer; 515 feet of 21-inch pipe sewer.
3171	Sept. 30	W. F. Brenizer Co ....	Westminster College grounds, Anacostia. S street NW. between Eighteenth and Nineteenth streets; Hartford street NE. between Ninth and Thirteenth streets.	Construct 300 feet of 3 foot 6 inch sewer. Construct 450 feet of 2 by 3 foot sewer; 300 feet of 24-inch pipe sewer; 625 feet of 21-inch pipe sewer; 30 feet of 15-inch pipe sewer.
3182	Dec. 5	W. F. Brenizer Co ....	Galena street NE. between Sixth and Seventh streets. From First street and New Jersey avenue SE. to Pennsylvania avenue and John Marshall place NW.	Construct 650 feet of 15-inch pipe sewer. Construct 5,000 feet of 3 foot 6 inch circular sewer.
3189	1903. Feb. 19	M. F. Talty.....	Cathedral avenue, between Connecticut avenue and Woodley road. Fifteenth street SW., between C and D; D street SW., between Fourteenth and Fifteenth; Fourteenth street SW., between D street and Maryland avenue.	Construct 960 feet 24-inch pipe sewer. Construct 965 feet 24-inch pipe sewer and 410 feet of 18-inch pipe sewer.
3191	Mar. 3	Andrew Gleeson .....	Jefferson street east, from Taylor street Anacostia.	Construct 840 feet of 10-inch pipe sewer.
3221	June 29	E. G. Gummel.....	Michigan avenue, between Lincoln avenue and point west of; Harewood road, between Michigan avenue and point north of; Bunker Hill road, between Lincoln avenue and point east of.	Construct 900 feet of 3 foot by 4 foot 6 inch; 900 feet of 2 foot 6 inch by 4 foot 6 inch; 600 feet of 21-inch pipe; 460 feet of 21-inch pipe sewer.

## *Statement of contracts for improvement of streets, avenues, and roads for the fiscal year 1903.*

No.	Date.	Name and address of contractor.	Location.	Character of work.
3073	1902. July 24	M. F. Talty, Washington, D. C.	Connecticut avenue, west of Rock Creek, from Randolph street, Fernwood Heights, to Pierce Mill road.	Grading.
3115	Aug. 15	T. M. Bond .....	Nebraska avenue, between Newark street and Tenleytown road.	Do.
3158	Aug. 8	Washington Asphalt Block and Tile Co.	Where ordered.....	Asphalt-block pavements.
3161	Aug. 12	M. F. Talty .....	do.....	Grade, set curb and gutters.
3162	do .....	do .....	New Hampshire avenue, between Whitney and Brightwood avenues.	Grading.

# OPERATIONS OF THE ENGINEER DEPARTMENT, D. C. 121

## Statement of contracts for improvement of streets, etc.—Continued.

No.	Date.	Name and address of contractor.	Location.	Character of work.
1363	1902. Aug. 16	G. B. Mullin .....	Kenesaw avenue, Nineteenth street to Zoological Park; Quincy street, Twenty-ninth street to Pierce Mill road.	Grading.
1366	Oct. 22	Barber Asphalt Paving Co.	Where ordered .....	Sheet-asphalt paving.
1396	1903. Apr. 3	Colbern Paving Co. ....	Western High School .....	Grade lot and sidewalk space.

## Statement of contracts for general supplies, fiscal year 1903.

No.	Date.	Name and address of contractor.	To furnish—
3072	1902. July 17	Chas. White, jr., Washington, D. C. ....	Miscellaneous castings.
3077	July 7	Louis Hopfenmaier, Washington, D. C. ....	Plumbers' material.
3079	July 8	B. Rich & Sons, Washington, D. C. ....	Boots and shoes.
3080	July 9	H. E. Wilkens Printing Co., Washington, D. C. ....	Blank forms and printing.
3081	...do	Lansburgh & Bro., Washington, D. C. ....	Dry goods.
3082	July 10	Chas. E. Lyman, Washington, D. C. ....	Groceries.
3083	...do	Globe Printing Co., Washington, D. C. ....	Blank forms and printing.
3084	July 11	Edward Stephens, Washington, D. C. ....	Drugs.
3085	...do	American Ice Co., New York City .....	Ice.
3086	July 12	Cuyler & Mohler, Baltimore, Md. ....	Plumbers' material.
3088	...do	J. M. Dulany, Baltimore, Md. ....	Stationery.
3091	July 15	J. T. Sprongmann, jr., & Bro., Washington, D. C. ....	Miscellaneous castings.
3094	...do	D. F. Parker, Washington, D. C. ....	Stationery.
3095	...do	C. S. Braisted, New York City .....	Do.
3096	...do	Chas. Becker, Washington, D. C. ....	Glass, paints, and varnish.
3097	July 16	Chas. G. Stott & Co., Washington, D. C. ....	Stationery.
3098	...do	Judd & Detweiler, Washington, D. C. ....	Blank forms and printing.
3099	July 17	Frank Hume, Washington, D. C. ....	Groceries.
3100	July 18	J. W. Bond Co., Baltimore, Md. ....	School books.
3101	...do	J. M. Dulany, Baltimore, Md. ....	Do.
3102	...do	W. M. Galt & Co., Washington, D. C. ....	Groceries.
3103	...do	Edw. Jenkins & Sons, Baltimore, Md. ....	Saddlery.
3106	July 22	Z. D. Gilman, Washington, D. C. ....	Drugs.
3108	...do	R. C. Ballantyne, Washington, D. C. ....	Stationery.
3112	July 29	Thos. Somerville & Sons, Washington, D. C. ....	Plumbers' material.
3113	July 30	Geo. F. Muth & Co., Washington, D. C. ....	Stationery, paints, oils, glass, etc.
3114	July 31	E. Morrison Paper Co., Washington, D. C. ....	Stationery.
3115	July 21	Geo. C. McKesson, New York, N. Y. ....	Drugs.
3116	July 24	F. J. White, Washington, D. C. ....	Miscellaneous castings.
3117	...do	T. J. O'Connor, Baltimore, Md. ....	Saddlery.
3118	July 25	J. C. Ergood Co., Washington, D. C. ....	Groceries.
3119	...do	S. R. Waters, Washington, D. C. ....	Do.
3120	Aug. 2	Rudolph, West & Co., Washington, D. C. ....	Hardware and tinware.
3121	Aug. 5	J. B. Lambie, Washington, D. C. ....	Hardware.
3122	Aug. 8	Saml. Ross, Washington, D. C. ....	Hardware and tinware.
3125	July 18	M. Duperow, Washington, D. C. ....	Electrical supplies.
3128	Aug. 2	American News Company, Washington, D. C. ....	Stationery.
3130	July 31	P. H. Sheehy Co., Washington, D. C. ....	Groceries.
3132	Aug. 13	R. P. Clarke Co., Washington, D. C. ....	Stationery and dry goods.
3133	...do	N. T. Elliott Printing Co., Washington, D. C. ....	Blank forms and printing.
3134	...do	Jos. Strashburger, Washington, D. C. ....	Boots and shoes.
3135	Aug. 12	Mackall Bros., Washington, D. C. ....	Drugs.
3136	Aug. 23	C. C. Pursell, Washington, D. C. ....	School books.
3137	Aug. 26	Johnson Bros., Washington, D. C. ....	Fuel.
3139	Aug. 28	J. E. Chapman, Washington, D. C. ....	Do.
3142	Aug. 30	Blum Bros., Washington, D. C. ....	Hardware, furniture, tinware, groceries, drugs, paints, and varnish, dry goods.
3144	Sept. 6	Church & Stephenson, Washington, D. C. ....	Lumber.
3146	Sept. 5	W. T. Galliher & Bro., Washington, D. C. ....	Do.
3150	Sept. 19	Hugh Reilly, Washington, D. C. ....	Glass, paints, and varnish.
3159	Oct. 15	Hoover & Denham, Washington, D. C. ....	Fresh meat and corned beef.
3167	Oct. 21	T. W. Smith, Washington, D. C. ....	Lumber.
3177	Oct. 18	Standard Oil Co., Washington, D. C. ....	Oils, etc.
3178	Nov. 18	W. B. Moses & Sons, Washington, D. C. ....	Furniture.
3181	Dec. 9	W. M. Galt & Co., Washington, D. C. ....	Forage.
3213	1903. June 25	B. Rich & Sons, Washington, D. C. ....	Boots and shoes.
3214	June 23	L. Hopfenmaier, Washington, D. C. ....	Plumbers' supplies.
3217	June 29	Francis Miller, Washington, D. C. ....	Paints and oils.
3218	June 24	Lutz & Co., Washington, D. C. ....	Drugs and saddlery.
3219	June 26	Edward Stevens, Washington, D. C. ....	Drugs.
3222	June 30	Thos. Somerville & Sons, Washington, D. C. ....	Plumbers' supplies.
3225	...do	W. B. Moses & Sons, Washington, D. C. ....	Furniture.

# 122 OPERATIONS OF THE ENGINEER DEPARTMENT, D. C.

*Statement of contracts for furnishing construction material for fiscal year 1903.*

No.	Date.	Name and address of contractor.	To furnish—
	1902.		
3070	July 2	Standard Brick Co., Washington, D. C.....	Sewer brick.
3071	July 5	Carter & Clarke, Washington, D. C.....	Bridge lumber.
3075	July 3	Frederick Brick Works, Frederick, Md.....	Sewer brick.
3076	July 7	Venable Bros., Atlanta, Ga.....	Curb.
3087	July 12	Washington Asphalt Block and Tile Co., Washington, D. C.....	Asphalt blocks.
3090	July 15	Mack Manufacturing Co., Philadelphia, Pa....	Vitrified blocks.
3092	....do....	....do....	Terra-cotta material.
3093	....do....	J. H. McGill, Washington, D. C.....	Natural cement.
3104	July 21	L. E. Smoot, Washington, D. C.....	Screened gravel.
3105	....do....	National Mortar Co., Washington, D. C.....	Portland cement.
3107	July 22	Columbia National Sand Dredging Co., Washington, D. C.....	Paving and concrete sand.
3126	....do....	W. W. Clarke & Son, Baltimore, Md.....	Portland cement.
3140	Aug. 29	M. J. Drummond & Co., New York City.....	Cast-iron water pipe.
3152	Sept. 24	United States Cast Iron Pipe and Foundry Co., Philadelphia, Pa.....	Do.
3175	Nov. 4	Dimmick Pipe Co., Birmingham, Ala.....	Cast-iron specials.
3179	Nov. 20	Mack Manufacturing Co., Philadelphia, Pa....	Sewer invert bricks.
	1903.		
3192	Mar. 12	T. W. Smith, Washington, D. C.....	Bridge lumber.
3194	Mar. 23	J. G. Waters & Son, Washington, D. C.....	Portland cement.
3195	Mar. 24	M. J. Drummond & Co., New York City.....	Cast-iron water pipe.

*Statement of construction, hauling, and miscellaneous contracts for fiscal year 1903.*

No.	Date.	Name and address of contractor.	Description.
	1902.		
3069	July 2	Johnson and Morton, Utica, N. Y.....	Distributing boxes and tablet boards.
3074	Oct. 16	James M. Dunn, Washington, D. C.....	Trumbull street pumping station.
3078	July 8	G. W. Knox Express Co., Washington, D. C....	Construct chemical engine house.
3089	July 14	Fredk. Springmann, Washington, D. C.....	Nichols avenue, Congress Heights.
3109	July 23	Chas. T. Hallway & Co., Baltimore, Md.....	Hauling bricks and blocks.
3110	....do....	American Fire Engine Co., Seneca Falls, N. Y..	Hauling cast-iron water pipe.
3111	July 24	Littlefield, Alvord & Co., Washington, D. C....	Chemical fire engine.
3123	July 12	Henri Kampmann, Baltimore, Md.....	Steam fire engines.
3124	July 16	W. H. Larman, Washington, D. C.....	Hauling miscellaneous construction material.
3127	July 29	The Seagrave Co., Columbus, Ohio.....	Coal and ash pockets in Trumbull street pumping station.
3129	Aug. 4	Art Metal Construction Co., Jamestown, N. Y..	Steam-piping system at Manual Training School No. 2.
3131	Aug. 13	Chesapeake and Potomac Telephone Co., Washington, D. C.....	Aerial hook and ladder truck.
3138	Aug. 22	Warren & Dyer, Washington, D. C.....	Metallic file cases and book racks for office of register of wills.
3141	Sept. 4	H. I. Gregory, Washington, D. C.....	Telephone cables.
3143	Aug. 27	Jno. A. Roebblings Sons Co., Trenton, N. J....	Glass blackboards at manual training schools.
3147	Sept. 9	Littlefield, Alvord & Co., Washington, D. C....	Gas engines and fans in connection with heating furnaces various public schools.
3148	Sept. 17	Washington Gas Light Co., Washington, D. C..	Signal and combination cables.
3149	....do....	....do....	Unload and haul screenings and broken stone.
3151	Sept. 22	American Development Co., Chicago, Ill.....	Erect, operate, and maintain gas lamps, in streets, roads, etc.
3153	Sept. 23	John A. Mead Manufacturing Co., New York City.	Operate, repair, and maintain gas lamps, as specified, in streets, roads, avenues, etc.
3154	Sept. 24	Coffin Valve Co., Boston, Mass.....	Furnish, operate, repair, and maintain naphtha lamps.
3155	Oct. 16	Gleeson & Humphrey, Washington, D. C.....	Coal and ash conveying equipment at Trumbull street pumping station.
3156	Oct. 17	Georgetown Gas Light Co., Washington, D. C..	Furnish and deliver gate and check valves.
3157	Aug. 8	E. J. Hannan, Washington, D. C.....	Construct 8-room school building, Pierce street NW., between First street and New Jersey avenue.
3160	Sept. 11	Burgess & Parsons, Washington, D. C.....	Operate, repair, and maintain gas lamps west of Rock Creek.
			Plumbing work in various public schools.
			Construct addition to girls' cottage on grounds of Industrial Home School.

# OPERATIONS OF THE ENGINEER DEPARTMENT, D. C. 128

*Statement of construction, hauling, and miscellaneous contracts for fiscal year 1903—Cont'd.*

No.	Date.	Name and address of contractor.	Description.
3164	1902. Aug. 22	Forsberg & Murray, Washington, D. C.....	Furnish and erect tubular boilers to Grant School.
3169	....do....	Brennan Construction Co., Washington, D. C..	Lay cement sidewalks where ordered.
3172	Nov. 1	.....	Construct 8-room school building Ninth and D streets NE.
3173	Oct. 9	H. I. Gregory, Washington, D. C.....	Mechanical heating and ventilating apparatus in school building, P street NW., between First street and New Jersey avenue.
3174	Oct. 29	....do....	Mechanical heating and ventilating apparatus in school building, Ninth and D streets NE.
3176	Nov. 10	W. F. Brenizer Co., Washington, D. C.....	Sewage-pumping equipment at Industrial Home School.
3180	Nov. 12	Chas. White & Co., Washington, D. C.....	Furnish and deliver lamp posts.
3183	1903. Jan. 3	Gleeson & Humphrey, Washington, D. C.....	Construct 8-room school building on southeast corner Twelfth and N streets NE.
3184	Jan. 10	H. I. Gregory, Washington, D. C.....	Mechanical heating and ventilating apparatus in school building at southeast corner Twelfth and N streets NE.
3185	1902. Dec. 27	H. Mueller Manufacturing Co., Decatur, Ill..	Furnish curb and corporation cocks.
3186	1903. Jan. 26	A. B. Stannard, New York, N. Y.....	Construct substructure foundation and superstructure for sewage-pumping station foot New Jersey avenue SE.
3187	Feb. 3	Burgess & Parsons, Washington, D. C.....	Construct 4-room addition to Cranch School building at southwest corner Twelfth and G streets SE.
3188	Feb. 18	Jas. M. Dunn, Washington, D. C.....	Construct 8-room school building west side Twenty-seventh street NW., between I and K.
3190	....do....	Osterman & Butler, Washington, D. C.....	Construct 4-room school building at intersection Hamilton and Naylor roads.
3193	Mar. 18	Pavarini & Greer, Washington, D. C.....	Construct complete 4-room addition to Brookland School at Wallace and Lansing streets.
3197	Apr. 11	....do....	Construct complete 4-room school building, intersection Howard and Emory streets, Fort Reno.
3198	Apr. 14	Otis Elevator Co., New York City.....	Furnish and erect complete two freight elevators in Trumbull street pumping station.
3199	Apr. 16	Chesapeake and Potomac Telephone Co., Washington, D. C.	Combination cables.
3200	Apr. 13	Lauer & Harper Co., Baltimore, Md.....	Furnish and erect steel trestle over Baltimore and Ohio tracks at Twenty-eighth street, Avalon.
3201	Apr. 25	W. E. Mooney, Washington, D. C.....	Constructing two floating baths in tidal reservoir of Potomac River.
3202	May 1	Union Lighting Co., Washington, D. C.....	Furnish, operate, repair, and maintain naphtha lights on streets, avenues, etc., for fiscal year ending June 30, 1904.
3203	Apr. 29	Chas. T. Halloway & Co., Baltimore, Md.....	Furnish and deliver one Hays aerial hook and ladder truck and equipments.
3204	....do....	....do....	Manufacture, furnish, and deliver chemical and hose combination wagons and equipment.
3205	Apr. 30	Lyons Bros., Washington, D. C.....	Construct wharf for new morgue on water front, between north line of M street and south line of N street.
3206	May 1	Dunigan Plumbing Co., Washington, D. C.....	Repair and change plumbing in police-court building.
3207	May 2	American Lighting Co., Baltimore, Md.....	Furnish, operate, repair, and maintain incandescent gaslights.
3208	May 21	Burgess & Parsons, Washington, D. C.....	Construct complete substation building for police department on Tenleytown road, near River road.
3209	May 19	R. V. Rusk, Washington, D. C.....	Clean unpaved streets.
3210	....do....	....do....	Sprinkle, sweep, and clean public alleys.
3211	May 23	W. H. Ellis & Co., Washington, D. C.....	Construct wharf for Naval Battalion of District of Columbia, foot of O street SW.

# 124 OPERATIONS OF THE ENGINEER DEPARTMENT, D. C.

Statement of construction, hauling, and miscellaneous contracts for fiscal year 1903—Cont'd.

No.	Date.	Name and address of contractor.	Description.
3212	1903. May 29	R. V. Ruak, Washington, D. C.	Sprinkle, sweep, and clean paved car- riageways in District of Columbia with flushing and side-sweeping machines.
3215	June 24	Camden Iron Works, Philadelphia, Pa.	Furnish and deliver cast-iron flanged pipe and specials.
3216	do	do	Furnish and deliver cast-iron flanged pipe and flexible joints.
3220	June 26	United States Cast Iron Pipe and Foundry Co., Philadelphia, Pa.	Furnish and deliver cast-iron water pipe.

## Schedule of bids for hauling; opened June 10, 1903.

Bidders.	Sand.	Gravel.	Paving brick.	Paving block.	6 by 20 curb.	8 by 8 curb.	Cast- ings.	Stone.
City of Washington:	Cu. yd.	Cu. yd.	Per M.	Per M.	Lin. ft.	Lin. ft.	Per ton.	Cu. yd.
Littlefield, Alvord & Co.	\$0.54	\$0.54	\$1.25	\$2.20	\$0.05	\$0.04	\$0.55	\$0.39
Merchants' Transfer and Storage Co.			1.37	1.89	.05	.035	.55	
Frederick Springman							.50	
City of Georgetown:								
Littlefield, Alvord & Co.	.64	.64	1.69	2.49	.05	.04	.65	
Merchants' Transfer and Storage Co.			1.45	2.03	.05	.04	.55	
Frederick Springman							.50	
East of Eastern Branch:								
Littlefield, Alvord & Co.	.54	.54	1.25	2.20	.05	.04	.56	
Merchants' Transfer and Storage Co.			1.37	1.89	.05	.035	.73	
Frederick Springman							.55	
West of Rock Creek:								
Littlefield, Alvord & Co.	.64	.64	1.49	2.49	.05	.04	.65	
Merchants' Transfer and Storage Co.			1.45	2.03	.05	.04	.73	
Frederick Springman							.65	
West of Georgetown:								
Littlefield, Alvord & Co.	.64	.64	1.49	2.49	.05	.04	.65	
Merchants' Transfer and Storage Co.			1.45	2.03	.05	.04	.73	
Frederick Springman							.65	
Additional haul, mile or fraction of:								
Littlefield, Alvord & Co.	.14	.14	.49	.75				.15
Merchants' Transfer and Storage Co.			.21	.26	.03	.03	.17	
Frederick Springman							.10	

## Schedule of proposals opened June 10, 1903, for furnishing material.

	Bidders.					
	Angus Lamond.	Jas. M. Porter.	W. Wirt Clarke & Son.	Baltimore Terra Cotta Works.	Potomac Terra Cotta Co.	Mack Manufact- uring Co.
24-inch terra cotta sewer pipe		\$0.97	\$1.17	\$1.17	\$0.965	\$1.365
21-inch terra cotta sewer pipe		.75	.90	.90	.7425	1.05
18-inch terra cotta sewer pipe		.51	.61	.61	.5049	.72
15-inch terra cotta sewer pipe		.41	.48	.48	.401	.57
12-inch terra cotta sewer pipe	\$0.30	.30	.36	.36	.297	.42
10-inch terra cotta sewer pipe		.23	.27	.27	.2228	.315
8-inch terra cotta sewer pipe	.12	.17	.18	.165	.165	.21
6-inch terra cotta sewer pipe	.075	.105	.104	.10	.099	.13
24 by 6 inch terra cotta Y branches		4.75	5.304	5.27	4.50	6.14
21 by 6 inch terra cotta Y branches		3.75	4.09	4.05	3.50	4.72
18 by 6 inch terra cotta Y branches		2.60	2.79	2.75	2.50	3.21
15 by 6 inch terra cotta Y branches		2.30	2.23	2.20	2.00	2.56
12 by 6 inch terra cotta Y branches		1.55	1.66	1.62	1.52	1.89
10 by 6 inch terra cotta Y branches		1.20	1.26	1.22	1.155	1.42
8 by 6 inch terra cotta Y branches	.75	.80	.85	.70	.78	.95
8 to 6 inch terra cotta reducers			.72	.62		
6-inch terra cotta bends	.25	.40	.39	.34	.363	.46
8-inch terra cotta bends	.40	.70	.72	.62	.65	.84
Vitrified sewer invert blocks	.50	.60				.75
Rect. rep. vitrified sewer invert bricks		17.00				20.95
Spec. sec. vitrified sewer invert brick No. 1						45.00
Spec. sec. vitrified sewer invert brick No. 2						45.00

# INDEX.

	Page
Report of Engineer Commissioner .....	III
Alleys:	
Paved under permit system .....	10
Paved under assessment system .....	16
Asphalt and cements:	
Report of inspector of .....	96
Asphaltic surface mixture .....	98
Assessment work:	
Sewers .....	62
Sidewalks, curbs, and alleys in city .....	16
Sidewalks, curbs, and alleys in county .....	16
Bridges .....	VI
Report of engineer of .....	30
Care of .....	31
Construction and repair of .....	31
Buildings and building inspection .....	VIII
Report of inspector of buildings .....	IX, 79
Permits issued and receipts .....	79
School buildings .....	79
Report of inspector of elevators .....	90
Cements:	
Report of inspector of asphalt and cements .....	96
Tests of natural and Portland cements .....	96
Proposals to furnish .....	117
Chief clerk:	
Engineer department, report of .....	108
Water department, report of .....	48
Conduits, electric line .....	73, 74
Contracts:	
For streets and roads, 1902 .....	120
For sewers .....	120
For construction materials .....	122
For construction, hauling, miscellaneous .....	122
For supplies .....	121
District stable .....	XII
Electric conduits laid .....	73, 74
Elevators, report of the inspector of .....	90
Employees:	
Temporary, first division .....	29
Temporary, second division .....	47, 50, 72, 85, 103, 178
Municipal building .....	III
Engineer of highways .....	3
Table A.—Street railways in the District of Columbia, July 1, 1902 .....	5
B.—Statement of character and extent of street pavements, July 1, 1902 .....	5
C.—Statement of mileage of street pavements, July 1, 1902 .....	6
D.—Descriptive list of street pavements, giving character, extent, cost, etc. ....	6
E.—Schedule of work on streets and avenues and county roads and sub- urban streets .....	3
F.—Repairs to asphalt and concrete pavements for year ended June 30, 1902 .....	6
G.—Work done at cost of railroad companies .....	7
H.—Work done by day labor under appropriation for "Current repairs to streets, avenues, and alleys" .....	8
I.—Regular permit work .....	10

	Page.
Table K.—Assessment work .....	16
L.—Replacing and repairing sidewalks and curbs around public reservations .....	22
M.—Miscellaneous work .....	24
N.—Whole cost work .....	26
O.—Repairs to cuts by plumbers and others .....	26
P.—Grading streets, alleys, and roads .....	26
Engineer of bridges, report of .....	30
Harding, Capt. Chester, report of .....	40
Highway-extension plans, report of Assistant Engineer W. P. Richards .....	100
Materials:	
Report of superintendent of property .....	101
Construction, kind and cost of .....	101, 102
Meters, water .....	49
Miscellaneous work:	
Streets .....	24
Sewers .....	71
Newcomer, Capt. H. C., report of .....	1
Numbering squares in county .....	
Parking commission, report of superintendent of .....	36
Pavements:	
Roadway .....	iv, 1
Granite block .....	5
Vitrified brick .....	5
Asphalt block .....	5
Report of engineer of highways—	
Concrete, repairs to .....	6
Laid at cost of street railways .....	7
Character and area of .....	5
Mileage of .....	6
Repairs to .....	2
Report of superintendent of streets .....	27
Repairs to plumbers' cuts .....	26
Permits:	
Report of permit clerk .....	105
List of, issued during year .....	105
Permit work:	
Sidewalks, alleys, and curbs in city .....	10
Sidewalks, alleys, and curbs in county .....	10
Plumbers:	
Cuts in pavements, repair of .....	26
Charges against, for cuts in pavements, etc .....	26
Plumbing, report of inspector of .....	75
Plumbing board, report of .....	78
Property:	
Report of superintendent of .....	101
(See also Materials.)	
Proposals received during year for—	
Asphalt pavements, repairs to .....	2, 113
Asphalt block pavements, for laying .....	113
Bricks .....	119
Buildings .....	113
Cement sidewalks, laying of .....	114
Cement .....	117
Grading and regulating streets and roads .....	113
Pipe, cast-iron water .....	118
Proposals received during year for sewers .....	108
Pumping stations .....	112
Railroad terminal .....	111
Railways, street, mileage of, in District of Columbia .....	5
Repairs:	
Streets, avenues, and alleys .....	8
Plumbers' cuts .....	26
Roads and suburban streets .....	3
Replacing sidewalks and curbs around reservations .....	22
Retent on contracts .....	vii

	Page.
<b>Roads:</b>	
Report of superintendent of.....	27
Repair of.....	27
<b>Rock Creek Park.....</b>	vii
<b>Sewers:</b>	
Report of superintendent of.....	x, 50
Main and pipe.....	64
Suburban.....	51-68
Laid under permit system.....	51-60
Laid under assessment system.....	51-58, 60
Laid at whole cost of applicant.....	62
Miscellaneous work.....	71
Constructed under various appropriations, contract work.....	54
Average cost per linear foot of those constructed by day labor.....	72
Proposals for constructing sewers.....	108
<b>Sidewalks:</b>	
Around reservations.....	iv, 82
Laid under permit system, in city.....	10
Laid under permit system, in county.....	10
Laid under assessment system, in city.....	16
Laid under assessment system, in county.....	16
<b>Stables, District.....</b>	xii
<b>Street extensions:</b>	
Report of Assistant Engineer W. P. Richards.....	100
<b>Streets:</b>	
Report of engineer of highways.....	3
Mileage of paved.....	6
Character and area of pavement of.....	6
Report of superintendent of.....	27
Current repairs to.....	8
Miscellaneous work on.....	24
Repairs to plumbers' cuts in.....	26
Repairs to suburban streets.....	26-28
Superintendent of parking.....	36
Superintendent of property, report of ( <i>see Materials</i> ).....	101
Superintendent of roads, report of.....	27
Superintendent of sewers, report of.....	50
Superintendent of streets, report of.....	27
Superintendent of repairs.....	92
Superintendent of water department.....	40
Surveyor's office.....	iii
Report of surveyor.....	32
Subsurface and building division, report of.....	40
Surface division, report of.....	1
<b>Temporary employees:</b>	
In first division.....	29
In second division.....	47-50, 72, 103, 178
<b>Tests of engineering materials:</b>	
Report of inspector of asphalt and cements.....	96
Cement, natural and Portland.....	96
Asphaltic mixtures.....	98
<b>Trees. (<i>See Parking commission.</i>)</b>	
<b>Water registrar and chief clerk, report of.....</b>	vii, 48
<b>Water service:</b>	
Report of Capt. Chester Harding.....	x, 40
Distribution.....	42
Mains laid during the years.....	42, 43
Revenue and inspection branch.....	46
Report of superintendent.....	40
Length, size, and cost of mains laid during year.....	44
Length, size, and cost of mains laid between 1878 and 1902.....	45
Cost of laying mains.....	45
Daily consumption of water.....	47
Meters.....	49
Pumped during year.....	40
Pumped per day, mean.....	40
Coal burned.....	40

Water service—Continued.	Page.
Report of superintendent—Continued.	
Cost of pumping during year .....	41
Cost per foot for laying mains .....	42
Cost of mains laid for high service from July 1, 1893.....	43
Report of water registrar and chief clerk .....	45
Receipts and expenditures during year .....	46
Premises supplied with Potomac water.....	49
Revenues, comparative statement of.....	x, 48
Wells, number of shallow and deep.....	47
Whole cost work:	
Streets, roads, etc .....	28
Sewers .....	62

O















**This book is under no circumstances to be  
taken from the Building**

[illegible]

10527 17 100

